EXAMINING THE RELATIONSHIPS AMONG PATIENT SATISFACTION, NURSE SATISFACTION, PHYSICIAN SATISFACTION, AND PERCEIVED MANAGEMENT SUPPORT

by

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ABSTRACT

Purpose: This retrospective cross-sectional quantitative study is designed to examine and measure the relationships among perceived management support and the satisfaction levels of three groups of healthcare stakeholders--patients, nursing staff, and physicians--through an analysis of 2012 survey data from 86 hospitals. **Methods:** Analyses to evaluate associations among the variables were conducted including multivariable linear regression, correlation, mediation analyses, and associated statistical tests. **Results:** The research focuses on a framework surrounding patient satisfaction as it is related to nurse and physician satisfaction. Additional variables influencing nurse and physician satisfaction are also examined. **Conclusions:** The researcher is proposing a framework which is missing in the healthcare field in order to understand the components of patient satisfaction which is a critical contribution to overall patient outcomes and an important component of pay-for-performance metrics.

Keywords: communication and collaboration, consumer confidence, customer loyalty, healthcare operational research, healthcare stakeholders, hospital experience, management in healthcare, managing healthcare experiences, nurse leadership, nurse manager, nurse retention, nurse satisfaction, nurse work engagement, nursing organization, patient satisfaction, patient-centered care, physician engagement, physician leadership, physician retention, physician satisfaction, quality of care, quality, service excellence in healthcare, systems and leadership, teamwork.

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CHAPTER 1: INTRODUCTION

1.1. Problem Statement and Introduction

The increasing need to improve health care quality has helped drive government agencies such as the Centers for Medicare & Medicaid Services (CMS), health care providers, and payors alike to better define and measure the quality of health care. Since it has been believed for some time that there is a strong link between patient satisfaction and patient outcomes, patient satisfaction has been identified as a key dimension of health care quality (Cleary & McNeil, 1988; Rahmqvist & Bara, 2010; Withrow, 2006 & 2018). Furthermore, the introduction of the CMS Hospital Value-Based Purchasing (HVBP) program has included patient satisfaction as an important component of pay-for-performance metrics (U.S. Dept. of Health & Human Services, 2011). Since U.S. fiscal year (FY) 2013, 30% (FY 2013 to 2015) to 25% (FY 2016-2020) of the value-based incentive payments to about 3,000 hospitals across the U.S. have been based on the results of satisfaction surveys completed by patients. From the program, participating hospitals either earn a bonus payment or are penalized through Medicare reimbursement. According to CMS records, around one-third of the participating hospital faced penalties in FY 2017 and FY 2018. (CMS, 2017).

While the incentives program has received a negative reaction from hospital executives who are anxious to minimize year-over-year reimbursement reductions and from researchers who doubt significant improvements can be driven by penalties, 1,196 (about 50%) hospitals earned a bonus from the program in FY 2017 and FY 2018 (CMS, 2017). Some researchers have found that hospitals with a strong culture of teamwork (Meterko et al., 2004) and meaningful communication among clinicians have better quality of care outcomes (DiMeglio et al., 2005). Some researchers have identified nursing satisfaction as influencing quality of care (Friedemann & Inselspital, 1997), while other researchers have

concluded that "happy doctors" and "happy patients" lead to better outcomes (Hass et al., 2000, pp. 122-8). Management support, such as fostering teamwork (Meterko et al., 2004), and facilitating interdisciplinary communication (DiMeglio et al., 2005), is thought to be critical to laying a foundation for patient-centered care (Bush, 2011). However, little research has shown strong empirical evidence establishing the relationships among patient satisfaction, nursing satisfaction, physician satisfaction, and management support.

1.2. Conceptual Framework

1.2.1. The Service Excellence Chain in healthcare

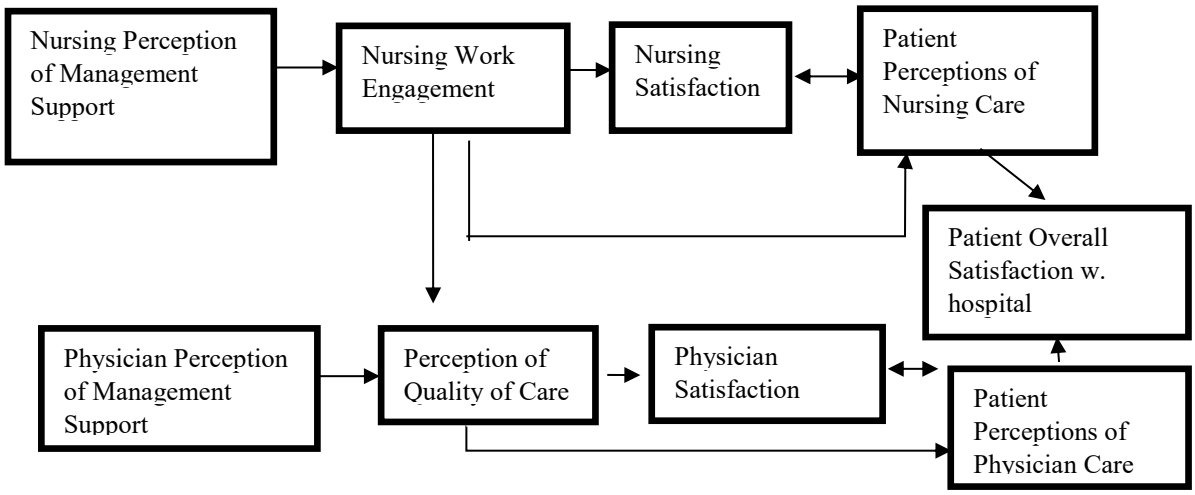
High quality of care, high levels of patient and clinician satisfaction, along with strong financial earnings are common characteristics of high performing health care organizations (HCOs). Performance excellence is not a destination but an ongoing process, and the journey towards service excellence starts with fostering a welcoming atmosphere, establishing a healthy healing environment with efficient and effective work processes, and engaging and supporting well-trained clinicians to encourage loyalty and productivity (Griffith & White, 2011, p.4). In addition, the journey opens opportunities to build a strong customer base and associated healthy financial performance. The general challenge for management is to sustain the cycle on a daily basis, and high performing HCOs have risen to this challenge (Griffith & White, 2011, p.4).

Employees in service-based industries strongly impact customer satisfaction and this clearly applies to health care. High performing HCOs establish and maintain a system truly functioning at its fullest which *"*delights*"* the care giving teams, doctors, nurses, and other associates who in turn "delight" their patients (Griffith & White, 2011, p.4). It is vital that HCOs understand the concept of employees' and associates' engagement and satisfaction and how the levels of engagement and satisfaction relate to patient satisfaction and overall patient

experiences. The Service Excellence Chain in Healthcare outlined in Appendix 1.1 illustrates the relationship between satisfaction and operational [management] support. Specific activities of management support are further displayed in Appendix 1.2.

Figure 1.1 below illustrates possible inter-relationships among patient satisfaction, physician satisfaction, nursing satisfaction, nursing work engagement, physicians' positive perception of quality of care, and nursing staff and physician's positive perception of management support. Nursing staff's perception of management support is an enabler for nursing work engagement, which mediates nursing satisfaction, patient perceptions of nursing care, patient satisfaction, and physicians' perception of quality of care. Physicians' perception of management support is an enabler for physicians' perception of quality of care, which mediates physician satisfaction, patient perceptions of physician care, and patient satisfaction.

Figure 1. 1. Study Aims and the Hypothesized Relationships among Study Variables



1.3. Study Objective

The objective of this quantitative study is to examine the relationships among patient satisfaction, nurse satisfaction, physician satisfaction, and perceived management support.

1.4. Significance of the Study

1.4.1. Rationale for managing patient experience vs. patient satisfaction

Managing patient experiences has been a top priority for hospital executives (Baird & Kirby, 2014). Managing experiences is not a new concept; however, many healthcare organization leaders often confuse optimizing satisfaction as equivalent to improving the patient experience. Experts define managing patient experience as alleviating patients' suffering and anxiety from their illness across the entire continuum of care (Stempniak, 2013). Patient satisfaction can be thought of as a measurable indicator of patients' perceptions of how their experiences are being managed. Since the introduction of the Consumer Assessment of Healthcare Providers and Systems (CAHPS) in 2008, the satisfaction scores have become publicly available and have an impact on the Hospital Inpatient Value-Based Purchasing Program reimbursement (U.S. Dept. of Health & Human Services, 2011).

Because patient satisfaction is one important patient outcome and is an important component of pay-for-performance metrics, more research which builds a theoretical framework for improving the satisfaction of patients is needed (Gill & White, 2009). This study seeks to examine and define the relationships among patient satisfaction, nursing satisfaction, physician satisfaction, and perceived management support. It intends to contribute to filed knowledge by proposing a framework regarding how the three key stakeholders impact one anothers' satisfaction levels as well as how specific management support activities influence nursing work engagement and perceptions of quality of care among physicians.

1.5. Organization of the Study

The following chapters describe this framework as well as the methods and results of this study. Chapter 2 presents a literature review of relevant research; Chapter 3 describes the details of the method and analytical procedures; Chapter 4 provides s a detailed review of this study's findings; and Chapter 5 discusses and synthesizes these findings, answers the research questions, and considers in detail the implications of the research.

CHAPTER 2: LITERATURE REVIEW

2.1. Purpose and Scope

The purpose of this literature review is to present insights regarding possible relationships among the satisfaction levels of physicians, nurses and patients and perceived management support within healthcare organizations. A review was conducted of various studies on "nurse work engagement," "nurse satisfaction," "patient satisfaction," "physician satisfaction," "quality of care and satisfaction," and "management support". Over the years, researchers have examined the areas of nursing work engagement, nursing satisfaction, patient satisfaction, and quality of care (Ancarani, Di Mauro, & Giammanco, 2009; Fasoli, 2010; Friedemann & Inselspital, 1997; Kangas, Kee, & McKee-Waddle 1999). Recent research has put more of an emphasis on how management support such as facilitation of teamwork, communication, relationship building, and leadership can engage nursing staff in their work, which leads to nursing work satisfaction and patient satisfaction (DiMeglio et al., 2005; Lewis-Hunstiger, 2006; Meterko, Mohr, & Young, 2004; Sellgren, Ekvall, & Tomson, 2008). A few studies have examined the direct effect that management support has on physician's perception of quality of care and physician satisfaction, as well as the relationship between physician satisfaction and patient satisfaction (Williams & Skinner, 2003). These studies demonstrate the necessity for healthcare executives to take a closer look at management support activities of their organizations and efforts in improving the quality of care. This chapter contains the following sections:

- Purpose and Scope
- Literature Search Methodology
- Patient Satisfaction and Managing the Experience in Health Care

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- Clinician Satisfaction and Patient Satisfaction: Why Is It Important?
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- Physician Satisfaction
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- Summary / Key Observations Based on the Literature Review

2.2. Literature Search Methodology

A comprehensive literature search was conducted of peer-reviewed and scholarly literature in biomedical databases, including PubMed, and ProQuest Central—a single periodical resource that brings together complete databases across many major subject areas,

including business, health and medical, language and literature, and social sciences, education, science, and technology. Google and Google Scholar search engines were also used to retrieve both published and unpublished literature from websites of government, non-profit organizations, and others. Subject headings and key terms incorporated in the search statements were those related to: work engagement, job satisfaction, staff satisfaction, employee satisfaction, physician satisfaction, consumer satisfaction, patient satisfaction, nurses, nurses work environment, organizational culture, nurse administrators, leadership, quality of health care, outcome and process assessment (health care), patient outcome assessment, management support, and management involvement. Advanced search options including Boolean operators allowed this investigation to combine search terms to narrow the search, resulting in a smaller list of more relevant materials. The searches were further limited to research conducted from mid-1990 to present with publications available in full text, in English, peer reviewed, and published in scholarly journals. Vetting of the literature search results led to the selection of papers for in-depth review and analysis. Bibliographic analysis of those papers elicited identification of additional, relevant literature.

2.3. Patient Satisfaction and Managing the Experience in Health Care

2.3.1. Patient satisfaction

In the entire service industry, consumer satisfaction is a critical part of quality outcomes, because satisfied customers are more likely to repurchase services, recommend them to others, and be loyal customers in the long term (Mittal, Ross, & Baldasare, 1998). Satisfaction is linked to memory-based processing (Yi, 1990), whereby negative information elicits a stronger physiological response and weighs more than a positive one (Peeters & Czapinski, 1990). Some research studies assume that the same logic is applicable to health care: satisfied patients are more likely to recommend their health-care providers to others and are willing to return when they need care (Otani, Waterman, Faulkner, Boslaugh, & Dunagan, 2010); on the other hand, dissatisfied patients may tell many others about the problems they encountered, share their disappointment with millions of people online (Fottler, Ford, & Heaton, 2010, pp. 359), or in some cases seek legal resolutions. Others argue that the relationship between repurchasing and satisfaction is nonlinear in health care—satisfied patients may not be loyal customers and often do not return (Mittal, Ross, & Baldasare, 1998, pp. 33–47).

2.3.2. Uniqueness of the healthcare industry: compassion

According to *Consumer Experience in Healthcare: The Moment of Truth*, a PricewaterhouseCoopers LLP (2012) survey of 6,000 U.S. customers across 11 industries in 2012, 72% of respondents expressed that personal experiences and provider reputation were major factors for selecting their health-care providers or hospitals in comparison to choosing a retailer, hotel, health insurer, or airline. The terms “consumer”, “customer”, and “patient” are often considered as interchangeable in health care. Some argue that language matters as many patients are sick and vulnerable people who cannot afford to shop around for the best

deal like consumers or customers (Goldstein & Bowers, 2015). A "patient" is historically considered a passive (Deber, Kraetschmer, Urowitz, & Sharpe, 2005; Wen, 2013) actor in the field of healthcare while a "consumer" or a "customer" is often regarded as an informed, rational decision maker (Tomes, 2006). There are very few circumstances in health care in which individuals can be accurately classified as consumers; these might include choosing a health plan, shopping for elective cosmetic surgeries, and selecting primary care physicians. Labeling individuals as "consumers" could further disregard the most critical element in effective care delivery: compassion (Lown, Rose, & Marttila, 2011; Plastow, 2010). Having compassion towards an individual's suffering often enables clinicians to provide effective treatment for the patients and to help create positive patient encounters.

2.3.3. Uniqueness of healthcare: trust transfer

Other unique aspects of the health-care industry in contrast to the rest of the service industry is trust and trust transfer, which are critical for relationship building, especially for healing relationships. A research study that examined the effect of health-care service quality (interaction, physical environment, and outcome quality) on trust, determined that the quality of interaction and outcome quality positively influence patients' trust in the original hospital. The study results confirm that trust in the original hospital can be transferred to its allied hospitals and facilities and positively affect patients' willingness to recommend all the hospitals / facilities in the system (Lien, Wu, Chen, & Wang, 2014). The research results further indicate that positive interaction with patients and active management of outcome quality greatly affect patients' trust and the trust transfer, which ultimately lead to repurchasing and becoming loyal customers.

2.3.4. Performance excellence and satisfaction

Across all industries, most business excellence frameworks, such as the Malcolm Baldrige National Quality Award and ISO 9000 quality system, are rooted in total quality management (TQM) principles (Daniel, 2012) that lead to long-term success through customer satisfaction. In health care, patient experiences have direct relationships with various outcomes (Bertakis & Azari (2011); Boulding, Glickman, Manary, Schulman, & Staelin, 2011; Glickman, 2010). In addition, researchers have suggested that patients who rate their health-care experiences as "Excellent" are more likely to return. Therefore, managers and leaders in hospitals and health systems should focus on achieving service and performance excellence as a way to distinguish their organizations from others in an emerging competitive health-care market (Otani, 2009). Health-care providers and practitioners have grown to value business analytics to focus and redirect their continuous improvement efforts and to encourage appropriate provider behaviors to focus on managing the patient encounter (Raju & Lonial, 2001). In essence, being market oriented means actively managing the patient encounter, which entails the eight principles of TQM: customer-focused, total employee-involvement / engagement, process-centered, integrated system, strategic and systematic approach, continual improvement, fact-based decision making, and communications (American Society for Quality, n.d.).

2.3.5. Measurement of patient satisfaction

Hospitals and health systems are facing increased pressure to enhance the patient experience due to the rapid rise of consumerism in health care and insurer policies regarding reimbursement. In April 2014, the Centers for Medicare and Medicaid Services introduced its five-star rating system for hospitals, which is based on the hospital consumer assessment of healthcare providers and systems (HCAHPS), nationally implemented in 2006. The rating

system drives 25%–30% of value-based purchasing (VBP) scores and incentive payments (U.S. Department of Health and Human Services, 2015) under the Patient Protection and Affordable Care Act (2010). The HCAHPS survey includes 21 core questions about patient's hospital experience in areas of communication with doctors and nurses, pain management, the quality of information at discharge, cleanliness, noise in patient rooms, transition of care, and overall hospital rating. Data produced from the survey allow objective and meaningful comparisons across hospitals on topics that are important to consumers. Public reporting of the survey results creates new incentives for hospitals to improve quality of care as well as increasing transparency of hospital care quality from the patient perspective, thus enhancing accountability in health care (U.S. Department of Health and Human Services, 2014).

During the 1990s, the focus on cost cutting and strong financial performance were the main concerns in health-care organizations (Brown, 2002). For many health care administrators, patient satisfaction has become an increasing concern for maintaining a healthy bottom-line while delivering high quality of care for the major health-care customer group, the patients (Baird & Kirby, 2014). This has been a clear shift in management theory and practice in health care. It is also observed that hospitals performing well on the survey focus on a broader spectrum of patient experiences beyond the HCAHPS (Bush, 2011), given that patient satisfaction is now viewed as part of health outcome quality, which also includes the clinical effects, economic measures, and health-related quality of life (Heidegger, Saal, & Nuebling, 2006).

In a patient satisfaction literature review, Gill and White (2009) identified five key major patient satisfaction theories including Donabedian's (1980) healthcare quality theory, which projected that the interpersonal process of care creates satisfaction. They supported

Donabedian's theory by presenting studies that identified critical determinates of satisfaction as interpersonal relationships and their related aspects of care across settings. They pointed out the urgent need for future research focusing on satisfaction and perceived health-care service quality, given that patient satisfaction is based on perceived service quality, an observable construct.

2.3.6. Patient-centered care

As the care model evolves in the health-care industry, the current trend focuses on patient centeredness that puts patients right at the center, surrounded by all kinds of clinical and nonclinical care providers. Hence, enhancing the patient experience should aim beyond pursuing the HCAHPS measures. "The experience is not about happiness. It's about patients being respected, being communicated with, and having their care coordinated in such a way that they can get the best possible clinical outcome for whatever their circumstances are," as well as "looking at the patient experience in total as reducing suffering and reducing anxiety … across the entire continuum of care, from the first phone call to the patient's being discharged" (Bush, 2011). Furthermore, this vision includes ongoing emotional support, family involvement, and care team integration, avoidable disruptions minimized, compassionate, empathetic caregivers, clear, actionable patient education, up-to-date and thorough information, physical and emotional needs anticipated (U.S. Department of Health and Human Services, 2014). In short, "If hospital leaders want to take the patient encounter to the next level, they need to focus on creating and sustaining a culture, aligned around patient-centeredness, along with engaging the people doctors are treating" (Kaplan, 2013).

A research study conducted by Johnson and Russell (2015) analyzed a patient satisfaction survey through the application of confirmatory factor analysis and structural equation modeling, and identified that the care provider's interaction with the patient has the

strongest impact on patient satisfaction. In the following sections, we will further explore the role of the provider and the association with their level of satisfaction and patient satisfaction.

2.4. Clinician Satisfaction and Patient Satisfaction: Why Is It Important?

"Work satisfaction refers to one's satisfaction with the actual content of the work performed, while career satisfaction is the extent to which individuals are happy with their overall career trajectory and the sum of their career experiences over time" (Hoff, Young, Xiang, & Raver, 2015). Work satisfaction has a strong positive relationship to customer satisfaction, according to numerous empirical studies (Band, 1988; George, 1990; Johnson, 1996; Reynierse & Harker, 1992; Schmit & Allscheid, 1995; Schneider, Ashworth, Higgs, & Carr, 1996; Schneider & Bowen, 1985; Schneider, White, & Paul, 1998; Ulrich, Halbrook, Meder, Stuchlik, and Thorpe, 1991; Wiley, 1991). The same has been observed in health care—positive changes in provider satisfaction lead to positive changes in patient satisfaction. Improved nurse satisfaction in the workplace is related to increased patient satisfaction (Kutney-Lee et al., 2009) and an improved quality of care (Aiken, 2011). Physician satisfaction has also been shown to be positively associated with patient satisfaction (DeVoe, et al., 2007; Haas, 2000; Linn, 1985).

2.4.1. Team work and motivation

Various research studies have provided some evidence that clinician satisfaction leads to patient satisfaction: when clinicians feel valued and enjoy working with their inter-professional teams, it translates to patient satisfaction (Pikey, 2011). Teamwork competencies play a role in bringing health professionals together to support patient care needs, especially in the contemporary evolving care model surrounding patients. However, often the fragmented systems within which the healthcare professionals frequently work do

not recognize or support effective teamwork (Chesluk, 2012). Under the new paradigm of healthcare reform, pay-for-performance and monetary incentives are commonly used tactics of healthcare organizations aiming to manage clinicians' motivation for performance improvement (Dalton, 2010; Hoff et al., 2015). Researchers have cautiously pointed out that such tactics only address extrinsic motivation, which may lead to negative effects such as disturbed teamwork, gaming the system, and crowd-out of intrinsic motivation due to inattention to the importance of actively supporting clinicians' intrinsic motivation (Browning, 2014). As Deming promoted— the joy from the job itself, the achievement, connection to purpose, camaraderie, and the job satisfaction derived from the ability to improve and control one's own work can be powerful motivating factors.

2.5. Physician Satisfaction

Physicians' satisfaction has been observed by many researchers as an important factor associated with patient satisfaction because "the interaction between a patient's and a physician's values, expectations of the encounter, attitudes, and experience may affect patient–physician communication and decision making, and therefore, affect satisfaction" (Haas, 2000; as Windish and Olson (2011, p. 44) stated, the "patient–physician relationship is the cornerstone for quality of health care." A study conducted by Hass et al., (2000) examining the relationship between the satisfaction of general internists and their patients identified factors that mediate the relationship between patient and physician satisfaction such as patient race, age of patients and physicians, practice size, language and communication, and physician's work status (PricewaterhouseCoopers LLP, 2012). The study established that patients and physicians modify each other's satisfaction levels. Other researchers further pointed out that physicians' work satisfaction not only has an effect on patient satisfaction, but also has an effect on care quality, patient outcome, patients' recall of

information, and patient adherence to treatment regiments (Chang, 2006; DiMatteo, 1993; Roter, 1989; Schneider, Kaplan, Greenfield, Li, & Wilson, 2004; Zachariae, et al., 2003).

2.5.1. Current states of physician work well-beingError! Bookmark not defined.: satisfaction, commitment, and engagement

In a 2013 national survey, 40% of physicians self-identified as being burned out (Donabedian, 1980; Peckham, 2013). Subsequently in 2015, a study examining the current state of the physician workforce also indicated a declining overall sense of well-being at work and increasing levels of burnout (Gregory, 2015). The study further identified that the largest drivers of burnout for physicians are workload, control, and values congruence. Burnout not only limits providers' compassion in effective care for the patients, it also negatively affects levels of staff / providers engagement, which correlates with lower quality patient care, lower patient satisfaction, lower productivity, and an increased risk of workplace accidents (Feeley & Swensen, 2016). On the other hand, a 2015 narrative review of 22 studies published between 1970 and 2013, provided a consistent observation over time that "overall, U.S. physicians experience stable moderate to high levels of job, work, and career satisfaction." The researchers suggested that "future thinking and research on physician satisfaction should align more with physician's everyday work situations, the array of changes now occurring within the U.S. medical profession, and the larger U.S. healthcare delivery system within which physicians work" (Hoff, Young, Xiang, Raver, & White, 2015).

2.5.2. Changes in the U.S. health care delivery system and the U.S. medical profession

The passage of the Affordable Care Act (ACA) created a pressing need for change in the U.S. healthcare delivery system, including the need to achieve high quality and cost-effective care, as well as an increasing focus on patient experiences/expectations. In

response, hospitals have begun to engage physicians as full-time salaried employees (O'Malley, Bond, & Berenson, 2011), to acquire medical practices, and/or to seek physician partners through mutually beneficial clinical re-alignment including medical directorships, professional services agreements, co-management services agreements, and lease arrangements (Salas-Lopez, Weiss, Nester, Whalen, & Fulton, 2014). Further, chiefly due to high overhead and reimbursement cuts to private practices, increasing numbers of physicians are leaving private practices for employment in healthcare organizations including hospitals and newer, integrated delivery systems (Jackson Healthcare, 2017).

The tradition of the U.S. physician as a self-employed, fully autonomous professional has moved into less direct ownership of operations and more salaried work that is depending on meeting performance targets to position hospitals and health systems in achieving better care coordination, increasing access to infrastructure, improving quality, and lowering costs under the new paradigm of healthcare reform (Kocher & Sahni, 2011). The changes have affected how physicians experience their jobs, work, and careers, and their satisfaction levels along with demographic shifts such as gender and age within the profession (Hoff et al., 2015).

2.5.3. Physicians' everyday work situation / work environment

A steady, growing stream of referrals and admissions from a base of committed medical staff members is key to growing and thriving for today's health-care market. A healthcare environment that positively engages physicians can potentially cultivate a base of committed medical staff (Condra & Pearson, 2008) and positive physician work performance (Al-Amin & Makarem, 2016).

A study conducted in 1992 found that physicians are often troubled by the lack of commitment to quality in the organization as well as their degree of autonomy and control

over patient care issues (Reynierse & Harker, 1992). A 2000 national survey of 751 practicing internists studied the influence of organizational structure on physician satisfaction and found that internists reported low levels of satisfaction with the environments in which they practice (LePore & Tooker, 2001). A 2001 survey further confirmed that physicians' negative perceptions of their health-care environments predicted their discontent (Magee & Hojat, 2001). Physicians' attitudes and perceptions about health-care organizations are shaped by the degree to which physicians identify with the organization, which may influence their cooperative behavior toward improving hospital performance and success and its effects on organizational performance (Al-Amin & Makarem, 2016; Dukerich & Golden, 2002).

In a 2003 study, physicians with lower levels of satisfaction tended to have personal health issues, work–life balance challenges, work-related issues, perceived lower patient satisfaction and outcomes, lower levels of referrals, and turnover (Williams & Skinner, 2003). A commonly used questionnaire related to physician satisfaction was used in a survey conducted by The Center for Health Future at Florida Hospitals in Orlando Florida, on a sample of 1,849 active Florida Hospital medical staff members. A 38-percent response rate was achieved (Bogue, Guarneri, Reed, Bradley, & Hughes, 2006). The survey examined physician satisfaction by exploring the areas within and outside physicians' work environments for which physicians were less and more satisfied. Table 2.1 below illustrates the sources / factors contributing to their satisfaction levels.

Table 2. 1. Factors Contributing to Physicians' Satisfaction Levels

Factors that Make Physician Less Satisfied	Factors that Make Physician More Satisfied
Cost containment efforts by the hospital	Relationships with patients

Factors that Make Physician Less Satisfied	Factors that Make Physician More Satisfied
Amount and quality of personal time	Relationships with colleagues
Opportunities for research and teaching	Family issues
Approaches to utilization review by the hospital	Personal growth
Autonomy over non-medical decisions	Freedom to provide quality care
Income	Availability of office and hospital resources
Administrative responsibilities	Prestige for role as physician
Organizational climate/culture of the hospital	
Workload	
Autonomy over medical decisions	

Note. Adapted from Bogue, Guarneri, Reed, Bradley, and Hughes, 2006.

In a meta-analysis conducted by Condra and Pearson (2008), the authors found that physicians desire an environment that demonstrates commitment to quality, fosters a high level of communication and collaboration, provides competent support services, and maintains strong financial relationships.

A 2009 "minimizing error, maximizing outcome" (MEMO) study initiated and conducted by Linzer et al. (2009), examined working conditions, physician reactions to those conditions, and healthcare quality at 119 ambulatory care clinics in the New York City and in the upper Midwest of the United States. The study found adverse working conditions cause negative physician reactions of dissatisfaction, stress, burnout, and intention to leave practice. Work conditions that were strongly associated with negative physician reactions were workflow issues, job characteristics, and poor organizational culture-value congruency between staff and administration.

Hammerly et al. (2014) identify that organizational efforts to improve physician alignment and satisfaction should take into consideration physicians' attitudes and physicians' behaviors, including their communication and interpersonal skills that are influenced by organizational structure, environment, and culture.

While there are a large number of studies focusing on physicians' job satisfaction, only a relatively small number of academic studies exist which confirm the connection between management support and physician satisfaction (Bell, Bringman, Bush, & Phillips, 2006; Bouwkamp-Memmer, Whiston, & Hartung, 2013; Cooper, Rout, & Faragher, 1989; Etchegaray et al., 2010; Hann, Reeves, & Sibbald, 2011; Jönsson, 2012; Konrad et al., 1999; Lavanchy, 2004; Lichtenstein, 1984; Mcintyre & Mcintyre, 2010; Mohr & Burgess, 2011).

2.6. Nursing Satisfaction

HCAHPS results have identified that many patients experience a lack of courtesy and respect, poor communication with providers, and problems in managing their pain according to the U.S. Department of Health & Human Services (2014). As patient satisfaction has become an important indicator of process quality within hospitals, an increasing amount of research indicates a positive relationship between a healthcare organization's culture and various performance measures including patient satisfaction. It is important for healthcare providers to understand patient satisfaction so as to anticipate and satisfy patient needs in order to have loyal patients and to prosper (Otani et al., 2009). A hospital culture that places emphases on openness, change, innovation, cohesion, teamwork, and employee morale has a positive impact on patient satisfaction. In contrast, a culture that overly stresses managerial control has an adverse effect on patient satisfaction, efficiency, and quality of care. (Meterko, Mohr, & Young, 2004; Weinberg, Avgar, Sugrue, & Cooney-Miner, 2013).

2.6.1. Predictors of nursing satisfaction—work environments

"A healthy work environment occurs when people are valued and treated fairly and respectfully with a strong sense of trust among all employees from the lowest to the highest positions within an organization" (Shirey, 2006). A healthy work environment is beneficial for employees, patients, and hospitals/ healthcare organizations because it values and supports a broad range of employees by providing desired work processes, encouraging work engagement, and promoting care quality (Bacon & Mark, 2009; Weinberg et al., 2013). "From an organizational perspective, creating work environments that foster higher levels of patient satisfaction requires understanding the interrelationships among hospital and nursing unit characteristics and their effect on patient satisfaction" (Bacon & Mark, 2009, pp.220–227). A meta-study conducted by Lukes (2007) and Cummings et al. (2010) examining more than 100 studies on the effects of nursing leadership on nursing practice confirm that nursing practice environment also influences safe and effective care. Therefore, nurses may be another important stakeholder in the delivery of care, and the satisfaction levels of nurses should also be considered as possibly influencing the patients' and physicians' levels of satisfaction.

A study conducted by Lephoko et al. (2006), which explores and describes environment as a predictor of nursing staff job satisfaction, suggests that nurse managers and leaders are responsible for creating a healthy work environment to promote a high level of performance and job satisfaction among nursing staff. Frontline nurse managers are the vital connection between senior management and the nursing staff. Nurse managers' abilities to lead have a direct effect on creating a work environment that fosters learning, joy, and customer orientation, which leads to nursing staff job satisfaction (Sellgren, Ekvall, & Tomson, 2008) and may lead to exceptional service quality (Scotti, Harmon, Behson, &

Messina, 2007; Teng et al., 2009), care quality (Bellou, 2010), and patient satisfaction (Lewis-Hunstiger, 2006). Another study conducted by Duffield et al. (2009) which investigated the importance of nursing leadership and management support revealed that work environment factors such as nurses' autonomy, control over their practice, and nursing leadership were statistically significant predictors of job satisfaction. Furthermore, several major environmental factors, collectively identified by various researchers, are considered as predictors of nursing satisfaction such as: management, physical environment, career development, learning, communication, performance management, motivation, empowerment, work engagement, and organizational alignment and support (Cullen, Edwards, Casper, & Gue, 2014; Huddleston, 2013; Kavanaugh, Duffy, & Lilly, 2006; Lephoko, Bezuidenhout, & Roos, 2006; Sadatsafavi, Walewski, Shepley, Krusie, 2015; Weng et al., 2010; Williams & Skinner, 2003). Managers represent the organization for their employees; therefore, perceptions of managers' level of support and values should greatly influence how their employees view the entire organization (Monahan, 2013). In essence, as W. Edward Deming pointed out: "management's overall aim should be to create a system in which everybody may take joy in the work…. Only by understanding what truly matters to staff will management be able to identify and remove barriers to joy. If physical and psychological safety is not ensured first, then it is more difficult to improve important elements of joy such as camaraderie, autonomy, and connection to purpose" (Deming, 1982).

2.6.2. Predictors of nursing satisfaction—motivation

Another factor closely linked to job satisfaction is motivation. Motivation in the workplace can be defined as an "individual's degree of willingness to exert and maintain an effort towards organizational goals" (Franco, Bennett, & Kanfer, 2002). Common

motivational theories used in healthcare are needs-based theories, which include Maslow's hierarchy of need and Herzberg's two factor theory.

Abraham Maslow's Hierarchy of Needs (Maslow, 1943) suggested that psychological health was dependent on the fulfilling of needs in order of priority starting from (1) survival, (2) safety, (3) belonging, (4) importance, to (5) self-actualization (Maslow, 1943). The theory is also applicable to employee engagement levels and how employees are engaged and motivated within the work environment. These needs are critical for the fulfillment of a satisfying professional life and career within the work environment. Reasonable wages, job security, and workplace safety are the basic needs of survival and safety. Having a strong organizational structure that promotes teamwork and inclusion create a sense of belonging for the employees. Employee recognition creates an emotional connection between organization and the employees, which in turn instill a sense of purpose, accomplishment, and importance. When employees feel important and recognized, they tend to take on more ownership of their role and more of a leadership role within their work environment; self-actualization is thus realized. In addition, their enthusiasm and attitudes inspire other employees to perform on their own levels. Figure 2.1 below illustrates Maslow's hierarchy of needs applied to employee engagement.

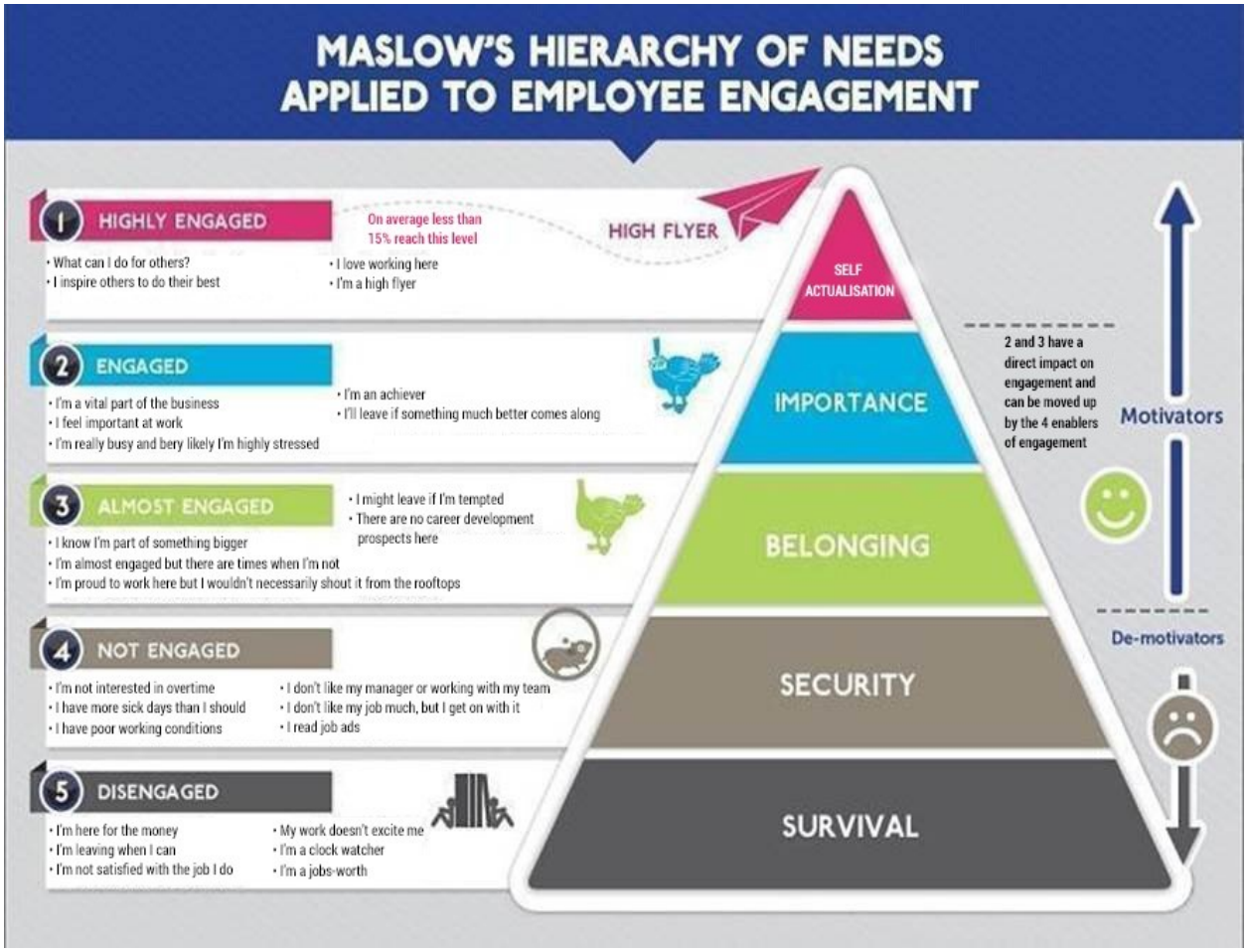


Figure 2. 1. Maslow's Hierarch of Needs Applied to Employee Engagement

Source: http://www.loyaltyworks.com/news-and-views/uncategorized/maslows-hierarchy-of-needs-and-employee-engagement

Frederick Herzberg's Two-Factor Theory (Herzberg, 1959) recognized that people are motivated by two factors: hygiene (extrinsic) and motivation (intrinsic) factors when considering individual work satisfaction. Hygiene factors are extrinsic to work, they are job factors fundamental at workplace which lead to work dissatisfaction when they are absent. Common hygiene factors include: salary, company policy and administrative policies, fringe benefits, interpersonal relationships, physical work condition, employee's status within organization, and job security. Hygiene factors are not considered as motivators according to Herzberg. (Herzberg, 2005). Motivation factors are intrinsic to work, they are essential factors involved in performing the job which lead to motivate employee for a superior performance and yield positive work satisfaction. The motivators signified the psychological needs that were perceived as an additional benefit, which employees consider intrinsically rewarding. Common motivation factors include: recognition, sense of achievement, growth and promotional opportunities, responsibility, and meaningfulness of work.

The Theory assumes that motivation comes from within individual; factors that motivates one individual might be a de-motivator for another. Further, removing dissatisfaction factors does not necessarily increase employee work satisfaction. When motivating a team using motivation factors, Herzberg suggests that the hygiene factors need to be met first. Figure 2.2 below illustrates the Two-Factor Theory in practice: combinations of hygiene and motivation factors result in four different scenarios at work.

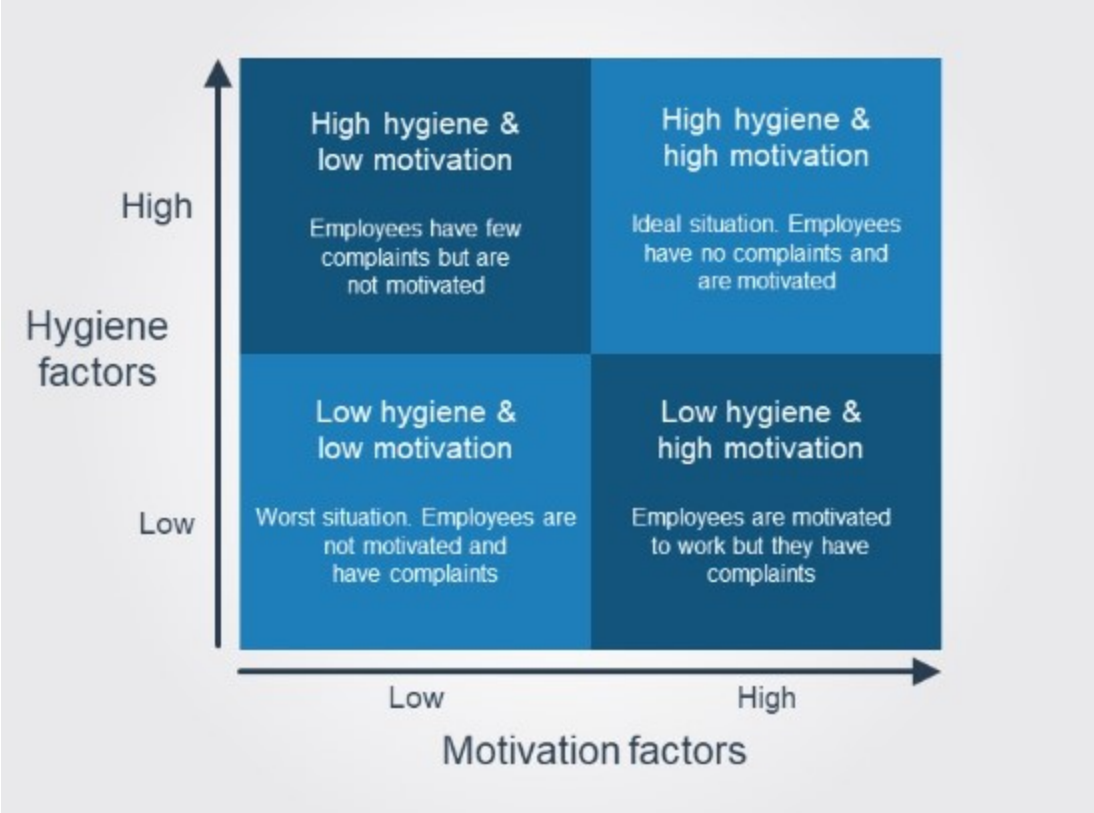


Figure 2. 2. Two Factor Theory in Practice: Combinations of Hygiene and Motivation Factors Result in Four Different Scenarios at Work.

Source: Kuijk, A. (2018). Two Factor Theory by Frederick Herzberg. Retrieved [July 1st, 2018] from https://www.toolshero.com/management/two-factor-theory-herzberg/

Both theories are based on the notions that internal needs drive employee behaviors: environmental conditions and employee attitudes influence employee motivation, which in turn impact their work performance. Further, both theories stress on meeting one stage of needs before advancing to the next. Herzberg's hygiene factors which correspond with Maslow's survival, security, and belonging, have to be met first. Herzberg's motivation factors, which correspond with Maslow's importance and self-actualization and belonging, are essential factors involved in performing the job which lead to motivate employee for a superior performance and yield positive work satisfaction.

2.6.3. Predictors of nursing satisfaction – work engagement

Another concept related to nursing satisfaction is work engagement. "Work engagement is a positive, fulfilling state of mind about work that is characterized by vigor, dedication and absorption…. Work engagement is the central issue for 21st century professionals and specifically for Registered Nurses" (Bargagliotti, 2012). According to the World Health Organization (2013) and the U.S. Bureau of Labor Statistics' (2013) Employment Projections, due to decades of underinvestment in health worker education, training, wages, working environment, and management, globally (including the United States) we will continue to experience health workforce shortages, especially for Registered Nurses. As the nursing shortage continues to have an adverse effect on health systems around the world, a long-term nursing retention strategy—which includes strategies to improve nursing satisfaction and nursing work engagement--has raised the interests of health care leaders, managers and researchers across the globe.

Nursing work engagement includes "the actions of nurses and nurse managers in creating an environment that either support safe and effective care or not," according to Bargagliotti (2012) in a concept analysis for work engagement in nursing. Bacon and Mark (2009) examined the relationships among hospital context, nursing unit structure, patient characteristics, and patients' satisfaction with nursing care in hospitals, their study suggested that support services and mechanisms that foster work engagement and effective symptom management, contribute to patient satisfaction (Bacon & Mark, 2009). Abdelhadi and Drach-Zahavy (2012) demonstrate a close relationship among work engagement, environment, and patient-centered care behaviors. They identify that nurses' work engagement mediated patient-centered care behaviors and suggest that managers should be dedicated in facilitating service environment through appropriate rewards, guidance, and administrative practices.

2.7. Summary / Key Observations Based on the Literature Review

This literature review is intended to provide a foundational awareness of relevant theory, concepts, research models, and content that will inform the conceptual framework design of this study. This review also illustrates the need for a deeper investigation among the relationships of the three key healthcare stakeholder groups' satisfaction levels, the healthcare environment, and the role of healthcare management. Specifically, three major observations can be drawn from our review which are summarized below.

1. Although there are some suggestive findings, no strong empirical evidence exists establishing the relationships among patient satisfaction, nursing satisfaction, physician satisfaction, and management support.
2. While numerous research studies identify some environment factors that have strong effects on nursing satisfaction, no research studies have focused on the causal pathways among management support, nursing engagement, nursing satisfaction, and patient satisfaction.
3. Although a large number of studies have focused on physicians' job satisfaction, no studies exist which confirm the connections between management support, physician's perceptions of the work environment / quality of care, physician satisfaction, and patient satisfaction.

CHAPTER 3: METHODOLOGY

3.1. Introduction

In this chapter, the design and the specific procedures used in conducting this study are described. This research aimed to make this chapter clear, comprehensive, and sufficiently detailed, so that other researchers can adequately judge this study's results and reliably replicate it. This methodology chapter contains the following sections:

- Introduction
- Rationale for research approach
- Research setting and context
- Research sample, population characteristics, data sources, and unit of analysis
- Information on Press Ganey survey instruments validation
- Data collection procedures, variables, and measures
- Protection of human subjects
- Data analysis methods: An overview and discussion
- Initial conceptual framework
- Testing of initial study hypotheses
- Summary

3.2. Rationale for Research Approach

Little research has shown strong empirical evidence defining the relationships among patient satisfaction, nursing satisfaction, physician satisfaction, and management support. This study seeks to examine these relationships by proposing a framework for how these three key stakeholders – nurses, physicians, and patients – impact one another's satisfaction as well as the specific management support activities that influence nursing work engagement and perceptions of quality of care among physicians.

This investigation utilizes a cross-sectional study design to examine the relationships among patient satisfaction, nursing satisfaction, physician satisfaction, and perceived management support retrospectively. The study design enables this investigation to compare different population groups (i.e., nurses, physicians, patients) and many different variables at a single point in time. Given the confidential nature of the survey, there was no possibility of linking records over time. In addition, the survey questionnaires were administered to assess respondents' satisfaction levels at one point in time.

3.3. Research Setting and Context

Studies have shown that perceptions of good leadership in nursing and management support are significant predictors of nurses' job satisfaction (Lephoko, Bezuidenhout, & Roos, 2006; Meterko, Mohr, & Young, 2004). Positive perceptions of management support may modify nursing behavior at work, for example, work engagement. Furthermore, nursing work engagement may serve as a predictor of nursing satisfaction and patient satisfaction. However, only a few studies have shown strong relationships among these variables (Gill & White, 2009). The rationale for studying the relationships among patient satisfaction, physician satisfaction, physician perceptions of quality of care, and physicians' perceptions of management support have also only been described in a few studies (LePore & Tooker, 2001; Condra & Pearson, 2008; Haas et al., 2000). In short, physicians' perceptions of management support and quality of care influence their satisfaction, which may impact patient satisfaction and other outcomes. This study will measure these areas with appropriate survey items to analyze the extent to which these variables influence one another in an inpatient setting.

3.4. Research Sample, Data Sources, Population Characteristics, and Unit of Analysis

All the data for the 86 hospitals included in the study are from the Press Ganey Associates, Inc. Data include demographics of each survey respondent, 86 acute care hospital demographic profiles, as well as the survey results of the inpatient survey, employee partnership survey, and physician partnership survey during the year of 2012. The inpatient survey data include responses of patients admitted to inpatient settings. The employee partnership survey data include responses of employees who identified themselves as Registered Nurses (RNs) or other nursing service professionals such as LPNs, Nursing Aides, and extenders. The responses from the non-RNs are excluded from the analysis. The physician partnership survey data include responses of physicians providing services, in any capacity, in inpatient settings at acute-care hospitals. Appendices 3.6 to 3.9 illustrate characteristics of the study populations at the patient level, hospital level, physician level, and nurse level respectively.

The unit of analysis is at the hospital level; included are all of the 86 acute-care hospitals that participated in all three PG surveys for patients, physicians, and nursing staffs in 2012.

3.5. Information on Press Ganey Survey Instrument Validations

3.5.1. Validity of the Press Ganey surveys

Press Ganey (PG) Associates has been a vendor of employee, physician, and patient satisfaction surveys since 1980. The inpatient survey, physician partnership survey, and employee partnership survey "were developed by conducting focus groups of patients, providers and/or administrators, reviewing surveys from health care facilities across the country, reviewing current professional and scientific publications on health care delivery, and utilizing the latest research on survey statistics and design" (Press Ganey Associates Inc.,

2016). The surveys have sound content validity due to their development with extensive input from industry executives, patients, managers, and employees to ensure that the questions are relevant and representative of issues (Press Ganey Associates Inc., 2016). The surveys have been repeatedly tested over time to ensure their statistical validity and reliability. PG survey validations collectively identified that the three surveys' face, content, and consensus validities had been established as the surveys focus directly on specific issues, are succinct, easy to understand, and clear. The survey questionnaires are effective because they possess three important attributes: focus, brevity, and clarity (Press Ganey Associates Inc., 2016). Survey validation results for each survey and corresponding psychometric properties are summarized below.

PG inpatient survey and its psychometric properties

A PG inpatient survey validation concluded that the survey was psychometrically sound across a wide variety of tests of reliability and validity (Press Ganey Associates Inc., 2010).

1. An item analysis using factor analysis methods was consistent with convergent and discriminant validity of the survey items.
2. An examination of a correlation matrix confirmed the unidimensionality of the instrument.
3. A series of simple regression analyses revealed that questionnaire responses had a high level of predictive validity: the instrument explains 64% of the variance in patients' likelihood to recommend the inpatient facility.
4. Reliability estimates range from 0.8 to 0.94; the Cronbach alpha for the entire questionnaire is 0.98, which confirmed the internal consistency and reliability for the questionnaires.

5. The questions were written at a 12th grade reading level for readability.

PG physician partnership survey and its psychometric properties

A PG physician partnership survey validation concluded that the survey was psychometrically sound across a wide variety of tests of reliability and validity. The questionnaires are effective at measuring doctors' satisfaction with hospital structure and processes per multiple test results (Press Ganey Associates Inc., 2003).

1. An examination of a correlation matrix confirmed the unidimensionality of the instrument.
2. A factor analysis along with item analyses suggested the instrument has convergent validity and discriminant validity – the questionnaire's effectiveness at measuring doctors' satisfaction with hospital structure and processes.
3. A series of simple regression analyses revealed the questionnaires' high level of predictive validity: the instrument explains 70% of the variance in doctors' likelihood to recommend the hospital.
4. Reliability estimates range from 0.68 to 0.93; the Cronbach alpha for the entire questionnaire is 0.96, which confirmed the internal consistency and reliability for the questionnaires.
5. The questions were written at a 12th grade reading level for readability.

PG employee partnership survey and its psychometric properties

PG employee partnership survey validation concluded that the "survey can be considered a user friendly, internally reliable scale that has sound evidence of validity according to standard test evaluation procedures. It can be used with confidence to assess the multiple facets

of the workplace, as perceived by those who work in the [healthcare] organizations, when a brief, rapid measure is required" (Press Ganey Associates Inc., 2011). The employee partnership survey was psychometrically sound across a wide variety of tests of reliability and validity (Press Ganey Associates Inc., 2011).

1. An examination of a correlation matrix confirmed the unidimensionality of the instrument.
2. An item analysis using factor analysis methods was consistent with convergent and discriminant validity of the survey items, except for pay and benefits which were not included in our model.
3. A series of simple regression analyses revealed the questionnaires' high level of predictive validity: the instrument explains 69.2% of the variance in employees' recommendations and perceptions of their work situation.
4. Reliability estimates range from 0.79 to 0.97; reliability estimates, using Cronbach alpha (0.98), for all questions confirmed the internal consistency and reliability for the questionnaires.
5. The questions were written at a 11^{th} grade reading level for readability.

3.6. Data Collection Procedures, Variables, and Measures

Reproductions of each survey instrument are available in Appendix 3.1 for the Press Ganey Inpatient Survey Instrument, Appendix 3.2 for the Press Ganey Employee Partnership Survey Instrument, and Appendix 3.3 for the Press Ganey Physician Partnership Survey Instrument.

3.6.1. Data collection procedures

3.6.1.1. Inpatient survey

Data collection began between 48 hours and six weeks following the discharges of individuals in the inpatient population of Press Ganey survey participating hospitals. (Demographics information of participating hospitals is available in Section 4.03.) According to the Consumer Assessment of Healthcare Providers and Systems (CAHPS®) Hospital Survey Quality Assurance Guidelines (Centers for Medicare & Medicaid Services, 2012), hospitals must survey patients throughout each month of the year and must also provide the Press Ganey survey vendor the list of all patient discharges, as well as a count of patients by exclusion category (Centers for Medicare & Medicaid Services, 2012). Hospitals can incorporate HCAHPS into their own patient survey, or use HCAHPS by itself (Centers for Medicare & Medicaid Services, 2009). Before or at patients' discharges, hospitals/survey vendors can inform patients about receiving the survey per HCAHPS guidelines. To avoid introducing bias in the survey results, hospitals/survey vendors are prohibited from conducting certain types of oral or written communications or including such communications in the HCAHPS survey materials, e.g., cover letters or telephone/active or interactive voice recognition (IVR) scripts. Nor are they allowed to conduct activities and encounters that are primarily intended to influence how patients, or which patients, respond to HCAHPS survey items (Press Ganey Associates Inc., 2014).

Surveys were administered to a random sample of inpatient adult patients across medical conditions and were not limited to Medicare beneficiaries. Eligibility criteria were as follows: 18 years old or older at the time of hospital admission, admission included at least one overnight stay in the hospital as an inpatient, non-psychiatric principal diagnosis at discharge, and alive at the time of discharge. Patient's ineligibility was determined after the

sample was drawn by applying exclusion criteria: deceased, court/law enforcement patient (i.e., prisoners), had a foreign home address, discharged to hospice (whether at home or another facility), eliminated from participation based on State regulations, or patients discharged to nursing home or skilled nursing facility (Lephoko, Bezuidenhout, & Roos, 2006).

Each of the individuals included in the sample population received a survey through any one of the four different survey modes: mail, telephone, mail with telephone follow-up, or active/ interactive voice recognition (IVR). A cover letter was included describing the purpose of the survey along with a return envelope. The survey was available in official English, Spanish, Chinese, Russian, Portuguese, and Vietnamese versions. Respondents were assured that their personal identity would be kept confidential. The survey itself, as well as detailed information on the standardized sampling, data collection and coding, as well as file submission, are contained in the HCAHPS Quality Assurance Guidelines, Version 7.0 for 2012, found at the official HCAHPS website, http://www.hcahpsonline.org/files/HCAHPS%20Quality%20Assurance%20Guidelines%20V7.0%20March%202012.pdf

During the year 2012, there were a total of 117,116 completed surveys, an approximately 80% percent response rate for patients from 86 Press Ganey participating hospitals that are included in this study. The national average survey response rate was at 33% for the year 2012, among 3,925 publicly reporting hospitals (Press Ganey Associates Inc., 2014). To achieve a desired level of statistical reliability, the targeted number of completed surveys is at least 300 per 12-month period as defined by CMS. In other words, participating hospitals had at least 25 completed surveys per month.

3.6.1.2. Employee partnership survey and physician partnership survey

The population of the employee and physician surveys comprised the entire nursing and physician staff of the 86 participating hospitals that use all three Press Ganey surveys for employees, physicians, and inpatients. The data set includes approximately 7,104 completed surveys from physician staff and 27,272 from nursing staff for a total of 34,376 completed surveys--approximately an 85 percent response rate for doctors and 80 percent response rate for nursing staff. Participating hospitals used Press Ganey to administer the surveys and deliver results. The survey itself was built upon a core set of mandatory items from Press Ganey's survey model, and enhanced with supplemental questions that came from Press Ganey's survey item bank and a few questions from participating hospitals. This study used the standard questions that all participating hospitals utilized during 2012. All rated survey questions used a 1-to-5 scale methodology. The survey was administered annually during a specific time of the year, determined by the participating hospitals. The survey was hosted through a third-party application. Access to the online survey was controlled through a user-known password that was required to enter the survey, and was matched against a list of qualified employees sent to Press Ganey beforehand. Paper-based surveys were provided to respondents who did not have access to computers; Press Ganey received and processed the paper-based surveys.

3.6.2. Variables and measures

3.6.2.1. Measures of the outcome variable

The main outcome variable for this study is patient satisfaction. The inpatient survey results collected during the year of 2012 for 86 hospitals were used to construct the measure of patient satisfaction in the study. Specifically, there were three patient satisfaction measures: patient satisfaction towards physicians, patient satisfaction towards nursing, and

patient overall satisfaction with the hospital, given that this investigation aims to study the extent of influence of nursing satisfaction and physician satisfaction on patient satisfaction. The patient perspective measurements consist of results of survey items shown in Tables 3.2 to 3.4.

Likert scales are applied in Press Ganey inpatient survey item response choices. Press Ganey converted the rating to a 100-point scale when providing results to its participating hospitals and to us, so that every item response was converted to 0 to 100 points. For example, response choice 4 is converted as 75 points. A 5-point Likert scale measuring the inpatient survey items and score conversion are illustrated in Table 3.1. Appendix 3.4 provides a reproduction of Press Ganey scoring conversion statement.

1	2	3	4	5
Very Poor	Poor	Fair	Good	Very Good
0	25	50	75	100

Table 3. 1. Rating Scale and Scoring Conversion of Survey Responses for Inpatient Surveys

Note: Table 3.1 is adapted from Press Ganey survey instruments and score calculations under a signed data use agreement between the Johns Hopkins Bloomberg School of Public Health and Press Ganey Associates, Inc. The scoring conversion is copy righted by Press Ganey Associates, Inc., 2011.

The definition of each of the patient satisfaction measures is provided below.

Patient Perceptions of Nursing Care (Satisfaction towards Nurses)

Definition - Patient's experience of the care provided by nurses during the inpatient hospital stay;

Numerator - Sum of the total points for survey items listed in Table 3.2;

Denominator -Total number of items x number of points possible for each item (total items =13);

Exclusions - OB-Gyn and mental health patients.

Table 3. 2. Patient Perceptions of Nursing Care Scale

#	Survey Item
N1	Friendliness/courtesy of the nurses
N2	Promptness in responding to the call button
N3	Nurses' attitude toward your requests
N4	Amount of attention paid to your special or personal needs
N5	How well the nurses kept you informed
N6	Skill of the nurses
D1	Staff concern for your privacy
D3	How well your pain was controlled
PI1	Degree to which hospital staff addressed your emotional needs
PI2	Response to concerns/complaints made during your stay
PI3	Staff effort to include you in decisions about your treatment
PI4	Speed of discharge process after you were told you could go home
PI5	Instructions given about how to care for yourself at home

Patient Perceptions of Physician Care (Satisfaction towards Physicians)

Definition - Patient’s experience of the care provided by physicians during the inpatient hospital stay.

Numerator - Sum of the total points for survey items listed in Table 3.3;

Denominator - Total number of items x number of points possible for each item (total items =6);

Exclusions - OB-Gyn and mental health patients.

Table 3. 3. Patient Perceptions of Physician Care

#	Survey Item
P1	Time physician spent with you
P2	Physician's concern for your questions and worries
P3	How well physician kept you informed
P4	Friendliness/courtesy of physician
P5	Skill of physician
D1	Extent to which you felt ready to be discharged

Patient Overall Satisfaction with the Hospital

Definition - Patient's collective experience of the care provided by physicians and/or nurses during the inpatient hospital stay;

Numerator - Sum of the total points for items listed in Table 3.4;

Denominator - Total number of items x number of points possible for each item (total items = 3);

Exclusions - OB-Gyn and mental health patients.

Table 3. 4. Patient Overall Satisfaction with the Hospital

#	Survey Item
OA1	How well staff worked together to care for you
OA2	Likelihood of your recommending this hospital to others
OA3	Overall rating of care given at hospital

3.6.2.2. Measures of Independent (Predictor) Variables

The independent variables for this study are nursing satisfaction, physician satisfaction, nursing work engagement, physicians' perceptions of quality of care, physicians' perceptions of management support, and nursing perceptions of management support.

A description of the independent variables utilized in this study is provided below.

Nursing Perspective Measurements

The employee partnership survey results collected during 2012 for 86 hospitals were used to construct nursing perspective measurements including: nursing staff satisfaction, nursing staff work engagement, and nursing staff perceptions of management support. The nursing perspective measurements consist of results of survey items shown in Tables 3.6 to 3.8.

Likert scales are applied in Press Ganey employee partnership survey item response choices. Press Ganey converted the rating to a 100-point scale when providing results to its participating hospitals and to this study, so that every item response was converted to 0 to 100 points. For example, response choice 3 is converted as 66.7 points. A 4-point Likert scale measuring the employee partnership survey and score conversion are illustrated in Table 3.05.

Appendix 3.5 provides a reproduction of the Press Ganey scoring conversion statement for the employee partnership survey.

4	3	2	1

Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
100	66.7	33.3	0

Table 3. 5. Rating Scale and Scoring Conversion of Survey Responses for the Employee Partnership Surveys

Note: Table 3.5 is adapted from the Press Ganey survey instrument for the employee partnership survey and score calculations under a signed data use agreement between the Johns Hopkins Bloomberg School of Public Health and Press Ganey Associates, Inc. The scoring conversion is copy righted by Press Ganey Associates, Inc., 2011.

Nurse satisfaction

Definition - Nurses' experience in providing care to patients in the inpatient hospital setting;

Numerator- Sum of the total points for items listed in Table 3.6;

Denominator - Total number of items x number of points possible for each item (total items = 2);

Exclusions - Responses from non-registered nurses.

Table 3. 6. Nursing Satisfaction

#	Survey Item
MW6	Overall, I am satisfied with my job
OO7	Overall, I am satisfied with this organization

Nursing staff work engagement

Definition - Nurses' level of engagement in work activities in the inpatient hospital setting;

Numerator - Sum of the total points for survey items listed in Table 3.7;

Denominator - Total number of items x number of points possible for each item (total items = 11).

Table 3. 7. Nursing Staff Work Engagement

#	Survey Item
OW1	Employees in my work group regularly express their concerns and suggestions about our work
OW2	Our employees do everything they can to provide high quality service
OW3	Employees in my work group are fully attentive to the needs of others
OW4	Employees in my work group report a strong sense of connection to their work
OW5	Employees in my work group do everything they can to make this organization successful
OO1	I plan to be working for this organization one year from now
OO2	I would recommend the healthcare services provided here to my friends and relatives
OO3	I would recommend this organization to a friend as a great place to work
OO4	I believe the quality of care is excellent
OO5	I think this organization is highly regarded in the community
OO6	The values of the organization are evident in our everyday practices

Nursing staff's perceptions of management support

Definition - Nurses' perceptions of how management supports their needs in patient care;

Numerator - Sum of the total points for survey items listed in Table 3.8;

Denominator - Total number of items x number of points possible for each item (total items = 26).

Table 3. 8. Nursing Staff's Perceptions of Management Support

#	Survey Item
SL1	Leaders do a good job of communicating major developments
SL2	Leaders really listen to employees

#	Survey Item
SL3	Leaders do a good job of planning for the future
SL4	As long as I perform well, this organization will try to find a place for me
SL5	My work group is asked for opinions before decisions are made
SL6	I have opportunities to influence policies and decisions that affect my work
SL7	Excellent performance is recognized here
SL8	Compared to other healthcare organizations my pay is fair
RE1	There is adequate staffing in my work group
RE2	I have the equipment I need to do my job well
RE3	Physical conditions (light, heat, space, appearance) in my area are good
DM1	My last performance review helped me improve
DM2	My direct manager provides coaching to help me achieve my goals
DM3	My direct manager recognizes my ideas or suggestions for improvement
DM4	My direct manager communicates effectively
DM5	My direct manager can be trusted
DM6	It is easy to talk to my direct manager about things that go wrong on my job
DM7	My direct manager recognizes my good work
TW1	There is good coordination of effort in my work group
TW2	Members of my work group treat one another with dignity and respect
MW1	My work gives me a feeling of accomplishment
MW2	My work makes good use of my skills and abilities
MW3	My work provides me an opportunity to be creative and innovative
MW4	I am given opportunities for ongoing education and professional development

#	Survey Item
MW5	My work is meaningful
OW6	Employees who work here are seldom distracted from their work

Physician Perspective Measurements

For the measurements of physician satisfaction, physicians' perceptions of quality of care, and physicians' perceptions of management support, the physician partnership survey results collected during 2012 for 86 hospitals were utilized. The physician perspective measurements consist of results of survey items shown in Tables 3.10 to 3.12.

Likert scales are applied in Press Ganey physician partnership survey item response choices. Press Ganey converted the rating to a 100-point scale when providing results to its participating hospitals and to this study, so that every item response was converted to 0 to 100 points. For example, response choice 4 is converted as 75 points. A 5-point Likert scale measuring the physician partnership survey items and score conversion is illustrated in Table 3.09. Appendix 3.4 provides a reproduction of the Press Ganey scoring conversion statement.

1	2	3	4	5
Very Poor	Poor	Fair	Good	Very Good
0	25	50	75	100

Table 3. 9. Rating Scale and Scoring Conversion of Survey Responses for Physician Partnership Surveys

Note: Table 3.9 is adapted from Press Ganey survey instruments and score calculations under a signed data use agreement between the Johns Hopkins Bloomberg School of Public Health and Press Ganey Associates, Inc. The scoring conversion is copy righted by Press Ganey Associates, Inc., 2011.

Physician satisfaction

Definition - Physician's experience in providing care in the inpatient hospital setting;

Numerator - Sum of the total points for the items listed in Table 3.10;

Denominator -Total number of items x number of points possible for each item (total items = 4).

Table 3. 10. Physician Satisfaction

#	Survey Item
FA1	Likelihood that you will maintain your level of admissions to, or procedures/surgeries at, this facility over the next year
FA2	Likelihood you would recommend this facility to other physicians
FA3	Likelihood you would recommend this facility to friends and family for care
SA3	Overall satisfaction with this facility

Physician perceptions of quality of care

Definition- Physician's perceptions of quality of care provided in the inpatient hospital setting;

Numerator- Sum of the total points for the items listed in Table 3.11;

Denominator- Total number of items x number of points possible for each item (total items = 2).

Table 3. 11. Physician Perceptions of Quality of Care

#	Survey Item
SA1	Overall quality of care at this facility
SA2	Degree to which this facility makes caring for your patients easier

Physician perceptions of management support

Definition - Physician's perceptions of how management supports his/her needs in patient care;

Numerator - Sum of the total points for the items listed in Table 3.12;

Denominator - Total number of items x number of points possible for each item (total items = 19).

Table 3. 12. Physician Perceptions of Management Support

#	Survey Item
QPC1	Staff's concern for and interest in your patients
QPC2	Staff's knowledge of patients' conditions and courses of treatment
QPC3	Staff's reliability in recognizing and reporting changes in patients' conditions
QPC4	Timeliness of follow-through on orders
QPC5	Quality of the nursing staff
QPC6	Overall rating of physician-nurse collaboration
QPC7	Access to patient information (e.g., availability of nurse assigned to patient, chart, test results)
EPF1	Ease of admitting patients
EPF2	Ease of scheduling inpatient tests/therapy
EPF3	Ease of scheduling outpatient tests/therapy
EPF4	Ease of scheduling outpatient surgery
EPF5	Turnaround for lab tests
EPF6	Turnaround for radiology results
CC1	Visibility/Accountability of Hospital Administration
CC2	Communication between yourself and Hospital Administration
CC3	Responsiveness of Hospital Administration to ideas and needs of the medical staff

#	Survey Item
CC4	Degree to which physicians are involved in decision making at this facility
CC5	Degree to which Hospital Administration seeks mutually beneficial solutions to physicians' issues
CC6	Degree to which you are treated as a valued member of this facility's medical staff

3.7. Protection of Human Subjects

The Johns Hopkins Bloomberg School of Public Health Institutional Review Board (IRB) classified this study as Not Human Subjects Research because secondary data were used for the study. The data were de-identified by Press Ganey to prevent tracing the individual responses to any participants or hospitals that utilized Press Ganey survey instruments for the inpatient survey, employee partnership survey, and physician partnership survey. The data are stored in ways that are secure and fully compliant with data confidentiality protocols of the Johns Hopkins IRB.

3.8. Data Analysis Methods: An Overview and Discussion

3.8.1. An overview

Statistical analyses were performed using Microsoft Excel, Statistical Analysis System (SAS; Version 9.2), and MPlus (Version 6.12; Muthen & Muthen, 1998-2015). The overall analysis consisted of three stages: data organization, exploratory data analysis, and advanced data analysis. Table 3.13 below shows a synopsis of the three stages.

Table 3. 13. Overall Analysis Plan

Data Organization	Exploratory Data Analysis	Advanced Data Analysis

• Receive de-identified data per data use agreement from Press Ganey
  ○ Note: the de-identified survey responses were already converted to 100-point scales when they arrived.
• Data cleaning and reorganization
• Determining how to handle missing data
• Creation of key variable scales in SAS
• Merge demographic data with survey data
• Determine final sample size
	• Exploration of distributions, procedure / model assumptions
	• Scree plots, factor analysis, item-item correlation, item means, and examination of survey item contents for new scales measuring latent variables
	• Item-scale correlation: Cronbach alpha-correlation coefficients to measure the internal consistency of corresponding survey items in each scale
	• Pearson correlation coefficient to estimate the correlation among the latent variables
	• Measurement model fit testing
		• Mediation analysis in structural equation modeling (SEM; Mplus):
		  ○ To identify the mediators on the hypothesized pathways from independent variables and dependent variables
		  ○ To estimate the proportion of the association of predictor variables and outcome variables that is mediated
		• Mediation analysis to estimate effects for mediators on the hypothesized pathways

3.8.2. Discussion of the methodology

This study followed an approach for performing the analysis of the study model similar to that first described by Anderson and Gerbing (1988). Such an approach led to an end-result of a theoretical model that consisted of two components:

1. Measurement models that specify relationships between latent constructs (the boxes in our diagram, see Figure 1.1) and their indicator variables (survey items listed within the boxes of our diagram, see Figure 1.1): This research identified latent construct of interest and indicated which observed variables (survey questions) measure each latent construct based on literature review, examination of item-scale correlations, and factor analyses for acceptable fit. During the factor analyses, we allowed all latent variables to covary (correlate).
2. A structural model that specifies directional relationships between latent variables. This study performed structural equation modeling (SEM – Latent Variable Path Analysis) to simultaneously determine whether the combined measurement and structural model provides an acceptable fit to data as well as obtaining support for its predictions. In this approach, this research re-specified the structural model by adding or removing latent variables / relationships and recomputed until a well-fitting model was achieved.

3.8.2.1. Study objectives, study design, and the statistical tests that were utilized

This investigation used statistical analysis approaches that can describe complex relationships (multiple meditation and moderation), deliver reliable measurements, provide accurate predictions to support the study objective, and that are appropriate for this investigation's study design. Given that this study's objective was to examine and define the

relationships among patient satisfaction, nursing satisfaction, physician satisfaction, and management support and this investigation utilized a cross-sectional study design - an observational study that offered a single-occasion snapshot of a system of variables and constructs at one point in time (Ding et al, 2014), structural equation modeling is applicable. As observed by MacCallum, et al. (2000) in their review of the application of analytical methods in study designs: "The use of structural equation modeling in cross-sectional designs is common in social/personality and industrial/organizational [studies], …. with applications to manifest variables, latent variables, or measurement studies.…. A notable feature of many [SEM] models used in cross-sectional studies is the specification of directional influences among variables" (MacCallum & Austin, 2000). For example, Körner et al (2015) used SEM in a cross-sectional study to investigate the relationships of organizational culture, teamwork, and job satisfaction in inter-professional teams. Raju and Lonial (2001) applied SEM to analyze cross-sectional survey data to further an understanding of the impact of quality context and market orientation on organizational performance in a service environment.

3.8.2.2. Structural equation modeling (SEM) to study mediation effects: the total, direct, and indirect effects

Structural equation modeling (SEM) is a statistical method to test and estimate causal relationships by using casual assumptions and statistical data (Wright, 1921). SEM is well suited for this investigation because it involves the specification of the effects of variables on each other; e. g. specifying direct effects of predictor variables on outcome variables. Each path in a pathway diagram (used to specific structural models) visibly represents a direct effect of a predictor variable on an outcome variable, the total and indirect effects implied by the same diagram. SEM, a highly flexible set of procedures, allows this investigation to

estimate and test its theoretical models that hypothesize causal relationships among variables, including the total, direct, and indirect effects, as well as to examine their estimates easily in the output for model estimation (AmirAlavifar & Anuar, 2012). In addition, SEM is considered as an effective and optimal technique for examining and testing the relationships among mediator variables (Baron & Kenny, 1986), which has the following key advantages over regression equation methods for mediation analysis:

- Regression allows for only a single dependent variable whereas SEM allows for multiple dependent variables. This study used SEM to test its theory through examining the strength of prediction / association in its model with multiple dependent variables as well as using several regression equations simultaneously (Chin, 1998; Gefen, Straub, & Boudreau, 2000).
- SEM allows for variables to correlate with one another, and thus enables this research to model the mediator variables to check and test the models with multiple dependent and independent indicators, whereas regression adjusts / controls for other variables (dependent and independent) in the model (Chin, 1998; Gefen, Straub, & Boudreau, 2000).
- SEM accounts for measurement error while regression assumes measurements are without error. With SEM, this research can improve the structural path coefficient reliabilities by applying terms of measurement error to the process of estimation (Chin, 1998).
- SEM allows this research to simultaneously incorporate both observed and unobserved / latent variables into our analysis, which strengthens the analysis for

its model. Regression equation methods are limited with regards to fitting unobserved latent constructs (AmirAlavifar & Anuar, 2012; Chin, 1998).

The specific SEM procedure used – latent variable path analysis makes it possible to investigate this study's models that predict causal relationships between variables, with some of the variables being latent factors. In this study's proposed framework, nurses' and physicians' perceptions of management support respectively, for example, are hypothetical constructs that are not measured directly, but whose presence is inferred based on the analysis of the manifest variables, i.e., measured variables – system and leadership, ease of practice…etc. This procedure allows the researcher to examine the hypothesized relationships using correlational data while allowing variables to be latent variables in this study's theoretical models. It simultaneously tests measurement and structural parameters (such as variances of latent variables, the beta coefficients, the regression weights, the error terms, residuals, and associated beta weights). Further, the procedure capitalizes on a combination of strengths of another two SEM procedures (Kline, 1991):

(1) Traditional path analysis - allowing us to determine whether there is empirical support for the causal relationships predicted by the theoretical path model.

(2) Confirmatory factor analysis (CFA) - to confirm that this research is measuring the hypothetical constructs of interest correctly.

Throughout the testing of hypotheses, this study utilized a latent variable modeling program with a wide variety of analysis capabilities, Mplus, (Version 7.3; Muthen & Muthen, 1998-2015) to test mediation (i.e., indirect effect) models of each hypothesis. Its ability to fit latent variables to a database that contains ordinal variables is very useful to this investigation.

3.8.2.3. Procedure assumptions

This research summarizes the assumptions underlying the latent variable path analysis procedure (Hatcher 1994; Keith 2006; Kenny 1979) in the following:

- Independent observations: each survey response is drawn independently from the population of interest.
- Multivariate normality
- Free of specification errors: the researcher endeavored to include all important determinants of the model's internal variables in this research's path models and exclude unimportant determinants.
- Free of measurement error: all variables are measured with high reliability.
- Linear and additive relationships – the relationships between all variables in this study's path model are linear and additive.
- Free of multicollinearity. No latent variables demonstrate extremely strong correlations with one another, $r \leq .80$.
- Adequate sample size. MacCallum and Austin's (2000) review of the application of SEM in published journal articles indicated that about 18% of the studies they reviewed used samples under 100 (MacCallum & Austin, 2000). A few available guidelines identify the ratio of sample size to estimated parameters (latent variables) ranging from 5:1 to 10:1 (Bentler & Chou, 1987; Kline, 2005). With a total of nine estimated parameters in this study's model, the required sample size would range from 45 to 90 according to the available guidelines. Regarding data quality, larger samples are required for non-normal data (Kline, 2005). Given the number of estimated parameters in this study's model (model complexity) and that study

variables are normally distributed, this study's sample size of 86 is considered as small to adequate.

3.8.2.4. Approach towards mediation analysis

This investigation used a non-parametric resampling test developed by Preacher & Hayes (2004, 2008), the bootstrap method, to conduct mediation analysis. It can help determine the mediation effect like other common approaches such as Sobel's test and Baron and Kenny's (1986) mediation analysis. The test does not rely on the assumption of normality in the calculation of standard errors; therefore, it is appropriate for small sample sizes (Hair et. al., 2014; Pardo & Roman, 2013). The test applies bootstrapping twice: first without the presence of mediation (direct effect), and then with the presence of mediation (indirect effect). The researcher calculated the variance accounted for (VAF) to determine the strength and nature of mediation: partial or full. VAF values greater than 80% is considered full mediation, between 20% and 80% is partial, and values less than 20% imply no evidence of mediation (Hair et. al., 2014).

3.8.2.5. Considerations for testing and examining results for each hypothesis

To test each hypothesis, the researcher began with two or three competing theoretical path models by adding or removing variables / relationships and re-computing until a well-fitting model was achieved. This research considered the following perspectives / points in testing and explaining results for its hypotheses (adopted from Hatcher, 2013, pp. 496-497):

- Are the manifest variables (survey items) measuring the latent factors?
- Did this research's initial theoretical path model provide an acceptable fit to the data?

- When this research's theoretical path model predicted that one latent factor had an association with another latent factor, how did the results support this hypothesis? For example, was the relevant path coefficient large and statistically significant?
- Which antecedent variables had the largest direct effects on the consequent variables? Which had the largest indirect effects? Which had the largest total effects?

3.9. Initial Conceptual Framework

As a starting point, the researcher constructed a conceptual framework—as in Figure 3.1 below—for studying the possible relationships of the three key groups of healthcare stakeholders' satisfaction levels and perceived management support at health care organizations.

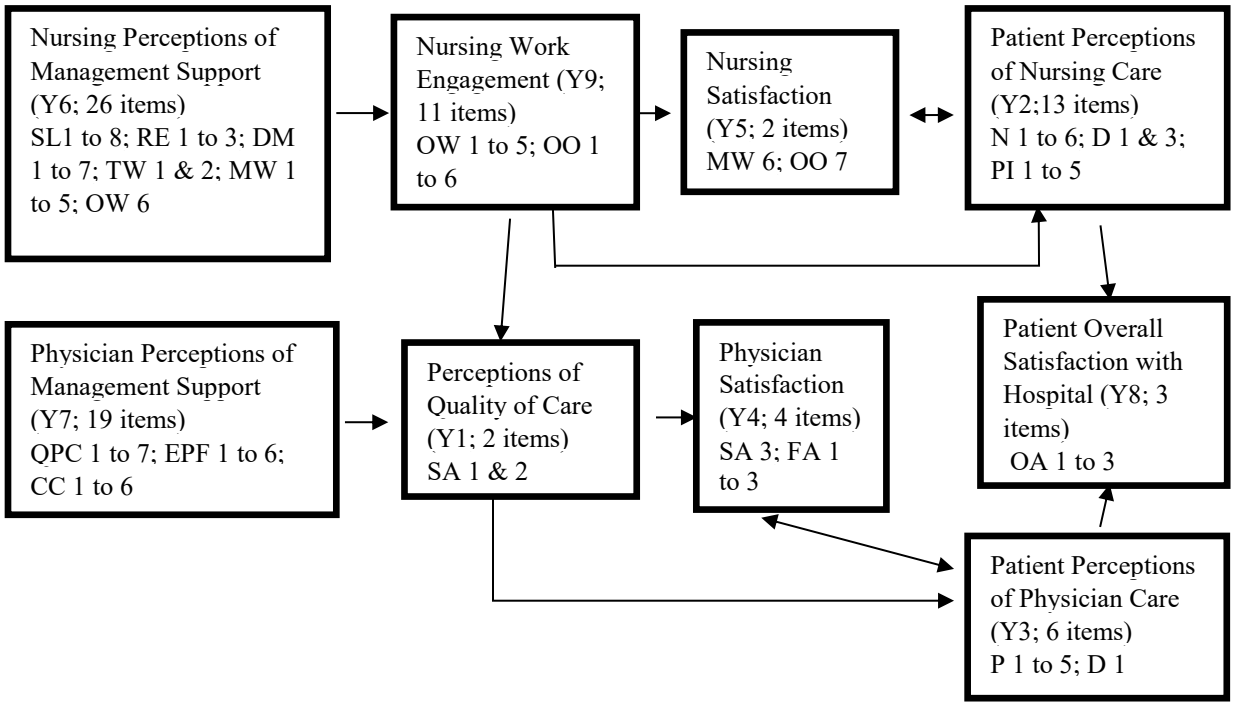


Figure 3. 1. Initial Conceptual Framework

Items below each study variable are survey questions selected from the Press Ganey survey instruments from the inpatient survey, employee partnership survey, and physician partnership survey.

3.10. Testing of Initial Study Hypotheses

After conducting exploratory analyses as indicated in the overall analysis plan, the following initial study hypotheses were developed for testing:

Initial Hypothesis 1.a (displayed in green arrows in Figure 3.2): Higher patient perceptions of nursing care are associated with higher nursing staff satisfaction, nursing staff work engagement, and nursing staff's positive perceptions of management support.

Predictor variables: Nursing Perceptions of Management Support, Nursing Work Engagement, and Nursing Satisfaction

Outcome variable: Patient perceptions of nursing care

Initial Hypothesis 1.b (displayed in blue arrows in Figure 3.2): Higher patient overall satisfaction with the hospital is associated with higher patient perceptions of nursing care, nursing staff work engagement, and nursing staff's positive perceptions of management support.

Predictor variables: Nursing Perceptions of Management Support, Nursing Work Engagement, and Patient Perceptions of Nursing Care

Outcome variable: Patient overall satisfaction with hospital

Analytical approach: Mediation analysis to identify the mediators on the causal pathway from the independent variable to the dependent variable and to estimate the mediation effect of the mediator between the independent and dependent variables.

Structural equation modeling was used to model the pathways in Figure 3.2 below.

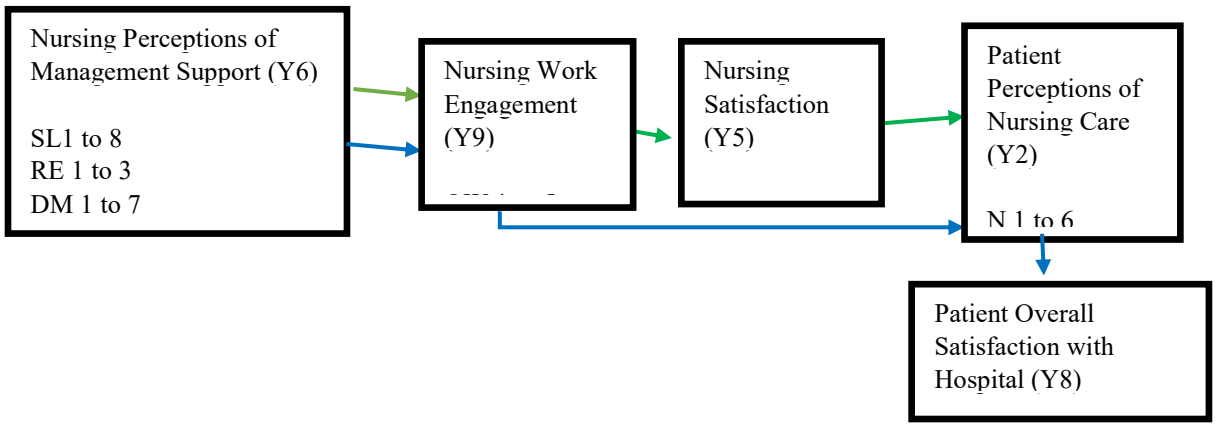


Figure 3. 2. Pathways of Initial Hypotheses 1.a and 1.b

Initial Hypothesis 1.a is displayed in green arrows. Higher patient satisfaction is associated with higher nursing staff satisfaction, nursing staff work engagement, and nursing staff's positive perceptions of management support.

Initial Hypothesis 1.b is displayed in blue arrows. Higher patient overall satisfaction with the hospital is associated with higher patient perceptions of nursing care, nursing staff work engagement, and nursing staff's positive perceptions of management support.

Initial Hypothesis 2 (displayed in green arrows in Figure 3.3): Higher nursing staff satisfaction will be associated with a higher level of nursing work engagement and nursing staff's positive perceptions of management support.

Predictor variables: Nursing Perceptions of Management Support and Nursing Work Engagement

Outcome variable: Nursing Satisfaction

Analytical approach: Mediation analysis to identify the mediators on the causal pathway from the independent variable to the dependent variable and to estimate the mediation effect of the mediator between the independent and dependent variable.

Structural equation modeling was used to model the pathway in Figure 3.3 below.

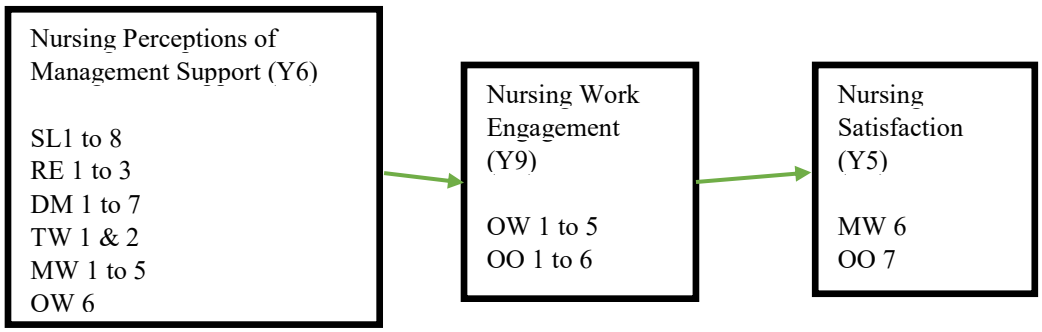


Figure 3. 3. Pathway of Initial Hypothesis 2

Initial Hypothesis 2 is displayed in green arrows. Higher nursing staff satisfaction will be associated with a higher level of nursing work engagement and nursing staff's positive perceptions of management support.

Initial Hypothesis 3.a (displayed in green arrows in Figure 3.4): Higher patient perceptions of physician care are associated with higher physician satisfaction, physicians' positive perceptions of quality of care, and physicians' positive perceptions of management support.

Predictor variables: physician satisfaction, physicians' positive perception of quality of care, and physicians' perceptions of management support

Outcome variable: Patient perceptions of physician care

Initial Hypothesis 3.b (displayed in blue arrows in Figure 3.4): Higher patient perceptions of physician care are associated with physicians' positive perceptions of quality of care, and higher levels of nursing work engagement.

Predictor variables: physicians' positive perceptions of quality of care and nursing work engagement

Outcome variable: Patient perceptions of physician care

Analytical approach for Initial Hypotheses 3.a and 3.b: Mediation analysis to identify the mediators on the causal pathway from the independent variable to the dependent variable and to estimate the mediation effect of the mediator between the independent variable and dependent variable.

Structural equation modeling was used to model the pathway in Figure 3.04 below.

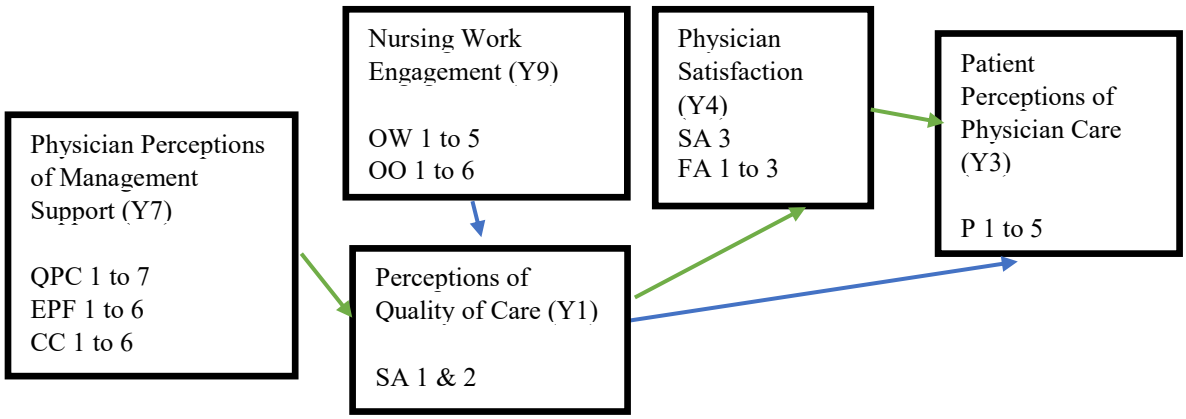


Figure 3. 4. Pathways of Initial Hypotheses 3.a and 3.b

Initial Hypothesis 3.a is displayed in green arrows. Higher patient satisfaction is associated with higher physician satisfaction, physicians' positive perceptions of quality of care, and physicians' positive perceptions of management support.

Initial Hypothesis 3.b is displayed in blue arrows. Higher patient perceptions of physician care are associated with physicians' positive perceptions of quality of care, and higher levels of nursing work engagement.

Initial Hypothesis 4.a (displayed in green arrows in Figure 3.5): Higher physician satisfaction will be associated with physicians' positive perceptions of quality of care and physician's positive perceptions of management support.

Predictor variables: physicians' perceptions of quality of care, and physicians' perceptions of management support

Outcome variable: physician satisfaction

Initial Hypothesis 4.b (displayed in blue arrows in Figure 3.05): Higher physician satisfaction will be associated with physicians' positive perceptions of quality of care and higher levels of nursing work engagement.

Predictor variables: physicians' perceptions of quality of care and nursing work engagement

Outcome variable: physician satisfaction

Analytical approach for Initial Hypotheses 4.a and 4.b: Mediation analysis to identify the mediators on the causal pathway from the independent variable to the dependent variable and to estimate the mediation effect of the mediator between the independent variable and dependent variable.

Structural equation modeling will be used to model the pathway in Figure 3.5 below.

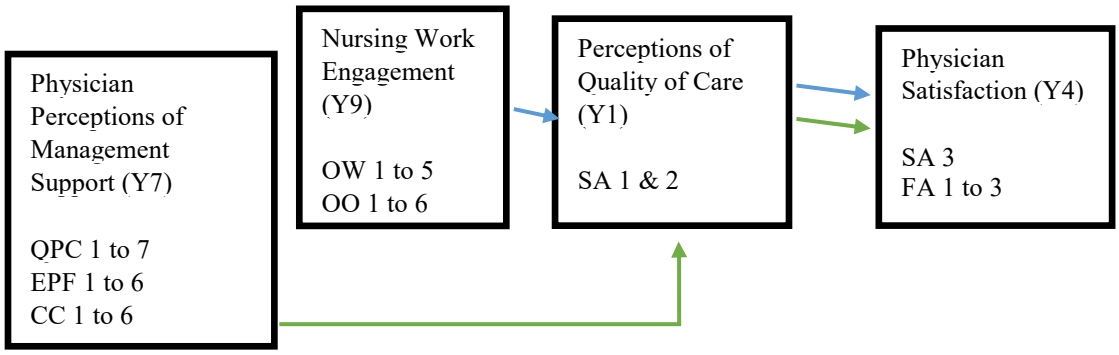


Figure 3. 5. Pathways of Initial Hypotheses 4.a and 4.b

Initial Hypothesis 4.a is displayed in green arrows. Higher physician satisfaction will be associated with physicians' positive perceptions of quality of care and physician's positive perceptions of management support.

Initial Hypothesis 4.a is displayed in blue arrows. Higher physician satisfaction will be associated with physicians' positive perceptions of quality of care and higher levels of nursing work engagement.

3.11. Summary

This chapter has provided the details of the research methods and analytical procedures. It has presented the research strategy, the research methods, the research approach, the methods of data collection, the selection of the sample, the research process, the type of data analyses, and the ethical considerations of our project. In the next chapter, Chapter 4, the data analysis methods, study results, and an interpretation of the findings will be presented. Data analysis findings will be described as correlations among the study variables and presented as tabulations and graphs. A proposed final model will also be identified.

CHAPTER 4: RESULTS

4.1. Introduction

As stated in Chapter 1, the study aims were to examine and measure in detail the strength of the relationships between perceived management support and the levels of satisfaction among three groups of healthcare stakeholders: patients, nursing staff, and physicians. This chapter organizes and reports this study's main findings, and contains the following sections:

- Introduction
- Data cleaning, missing data management, and final sample size determination
- Demographic distributions
- Survey item means of initial major study variables
- An overview of the results of this investigation
- Testing results of measurement model fit
- Bivariate correlation studies among latent variables
- Resulting framework for hypothesis testing
- Testing results for revised mediation hypotheses
- Evaluation results of the structural model
- Summary

4.2. Data Cleaning, Missing Data Management, and Final Sample Size Determination

Press Ganey provided a total of six files for demographic information and survey responses of patients, hospital staff, and physicians, as well as the demographic profiles of the participating hospitals. An overall first step was checking the raw data distribution for each variable in the datasets for nurses, doctors, and patients. As each dataset contains multiple variables, calculating the numbers of the variables with missing data was next. This step was essential to understand the potential impact of the missing data before determining how to handle the missing data. During this step, this study utilized SAS statistics software and procedures to produce the output needed for missing data analysis for each dataset. A sample size determination was based on the exclusion criteria and the number of missing data for each of the datasets for nurses, doctors, and patients. At this stage, the researcher excluded records with 90% missing data on variables of interest. Finally, this study merged all six files to further eliminate records that were out of scope for this study to arrive at a final number of records for each survey. Subsequently, the researcher determined an appropriate approach to handling missing data.

4.2.1. Hospital Demographic Data File

Among the 150 demographic records from 150 hospitals initially provided by Press Ganey, our first examination of records with missing data for 41 variables of interest, indicated that about 9.4% of the records in this dataset had missing data for 37 or more out of the 41 variables. These records were not sufficient for our study, and therefore, were excluded. This first examination resulted in 134 demographic records for 134 hospitals. Appendix 4.1 illustrates our first examination of the hospital demographic dataset for the number of variables with missing data.

4.2.2. Employee Partnership Demographic File - Data Cleaning and Missing Data Management

Among 92,157 employee partnership respondents' demographic records from 150 hospitals, the researcher selected records with job descriptions/titles as either Registered Nurse or licensed nursing staff (LPN, CNA) that met the scope of the study. This process resulted in 34,574 records from 139 hospitals for the study's first examination of employee partnership survey respondents' demographic dataset with respect to the number of variables with missing data. Appendix 4.2 illustrates the missing data distribution for the variable - job description.

Further examination of records with missing data on seven variables of interest, indicated that about 70% of the records in this dataset had complete data on all seven variables and 1.7% (596) of the records had missing data for five and above out of the seven variables. The records that only indicate employees' division and job title and left the rest of the demographic record blank were not sufficient for this study, and therefore, were excluded. This step resulted in 33, 978 employee partnership survey respondents' demographic records from 138 hospitals. Appendix 4.3 illustrates this study's first examination of the employee partnership survey respondents' demographic dataset for the number of variables with missing data.

4.2.3. Employee Partnership Survey File - Data Cleaning and Missing Data Management

Among 92,157 employee partnership survey responses from 150 hospitals, the researcher examined records with missing data for 39 variables of interest. About 85% of the records in this dataset had complete data on all 39 variables; 0.1% of the records had missing data for 34 out of the 39 variables. Since no case had significant missing data issues of 90%

or greater among the 39 variables, no record was deleted following the first examination. Appendix 4.4 illustrates our first examination of the employee partnership survey dataset for the number of variables with missing data.

4.2.4. Physician Demographic File - Data Cleaning and Missing Data Management

Press Ganey provided 12,062 records of physician survey respondent demographic data for 150 hospitals. This study identified and retrieved records with physicians' job descriptions that were related to the adult inpatient population – the scope of this study. Appendix 4.5 lists the frequency of job descriptions. Records with job descriptions excluded were: Adolescent Medicine, Obstetrics/Gynecology, Psychiatry, Other Medical Specialist, Other Oncology Specialist, Other Pediatric Specialist, Other Surgical Specialist, & Other. This first step provided 10,212 records of inpatient physician survey respondent demographic data for the 150 hospitals.

The researcher further exanimated records with missing data on six variables of interest. About 13.8% (1,408) of the records had missing data for five or all of the six variables, and therefore were excluded. This step resulted in 8,804 physician survey respondents' demographic records from 143 hospitals. Appendix 4.6 illustrates the first examination of the physician survey respondents' demographic dataset for the number of variables with missing data.

4.2.5. Physician Survey File - Data Cleaning and Missing Data Management

Among 12,062 responses for the physician survey from 150 hospitals, this study examined records with missing data on 26 variables of interest. More than half of the records in this dataset had complete data on all 26 variables; less than 0.3% of the records had missing data for 23 out of the 26 variables. This study excluded 32 records with significant

missing data issues of 90% or greater among the 26 variables. This first examination yielded 12,030 physician survey responses from 150 hospitals. Appendix 4.7 illustrates the first examination of the physician survey dataset for the number of variables with missing data.

4.2.6. Data Cleaning and Missing Data Management for the Inpatient Survey Dataset and Hospital Demographics

Among 171,078 responses to the patient survey from 150 hospitals, this study examined missingness among the 56 variables on the patient survey; 53,797 survey responses were identified as having missing data at 90% or greater. To understand the missing data, this study grouped the records by hospital ID to match with hospital demographic data for further analysis as well as making inquiries to Press Ganey regarding the blank patient survey responses. From an inquiry with Press Ganey the researcher learned that those blank patient survey responses were from hospitals that did not participate in the survey; therefore, they were out of the scope of this study. Thus, 53,794 blank patient survey responses that were out of the scope of this study and the corresponding hospital demographic profiles were excluded from the hospital demographic dataset. This study also excluded three patient survey records that had significant missing data issues of 90% or greater among the 56 variables of interest. These three records only contained answers for three questions that related to patient age, gender, and diet regimen in the hospital. In addition, patient age, gender, and diet regimen are not variables of interest due to the scope of this study. Resulting from this exercise are a total of 117,116 patient survey responses from 86 hospitals that participated in all three surveys – which are within the scope of this study. Appendix 4.8 illustrates the analysis for missing data on variables.

4.2.7. Missing Data Management and Final Sample Size Determination

After enhancing an understanding of missing data in the surveys, the researcher realized that records of hospitals that did not participate in the survey but were included in the files contributed to most of the missing data. Since these surveys were administered back in 2012, it may not be possible to completely understand how the surveys were or were not answered by the respondents. With an increased understanding of the datasets and the necessity for clear identification of the survey responses within the scope of our study, the researcher merged all six datasets by hospital ID to determine the final sample size of each dataset. By doing so, this investigation focused its study on hospitals that used three Press Ganey surveys at the same time to ensure that the survey administration method was consistent across all the respondents. A close examination of missing data of 86 hospital demographic profiles observe a large amount of missing data in the demographic profiles (see Tables 4.3 and 4.4). Therefore, it would be very challenging to control for hospital characteristics for multilevel analysis that evaluates effects in different subgroups such as hospitals grouped by locations (urban, rural…). The unit of analysis is thus at the hospital level without the inference to a population of sub-groups. On the other hand, the researcher subsequently realized that missing values were few for all other variables of interest and could be considered or assumed to be missing at random, and therefore, imputation and sensitivity analysis would not be necessary. Table 4.1 below illustrates the final record count after data cleaning and missing data management.

Table 4. 1. Final Sample Size Determination, Press Ganey Associates, Inc. 2012 Survey Data

	Initial # of Records	% of Missing Data: Records with 90% of missing data on variables of interest or not participating in PG patient survey	Final # of Records: after applying exclusion criteria and selecting records within scope of study
Hospital Demographic Data	150	49.3%	86
Inpatient Survey	171,078	31.4%	117,116
Employee Partnership Survey	92,157	0.1%	27,272
Employee Demographic Data	92,157	1.7%	27,272
Physician Partnership Survey	12,062	0.3%	7,104
Physician Demographic Data	12,062	13.8%	7,104

4.3. Demographic Distributions

Although it was not part of the purpose of the study, this set of data was intended to describe demographic variables which could influence the study variables of interest. The demographic data files illustrated in Tables 4.2 to 4.4 consist of participating hospital demographic; the demographic data files illustrated in Appendices 4.2 to 4.4 consist of, employee demographic, physician demographic, and patient demographic factors.

4.3.1. Hospital demographic profile

Tables 4.2 to 4.4 depict a demographic description of the 86 hospitals participating in three Press Ganey Surveys during the time frame. The Tables present the frequencies and percentages which summarize the participating hospitals' profiles.

Table 4. 2. American Hospital Association Regions: Region ID and State, Press Ganey Associates, Inc. 2012 Survey Data

American Hospital Association Regions Region ID and State	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1: CT, ME, MA, NH, RI, VT	3	4	3	3.5
2: NJ, NY, PA	3	4	6	7.0

American Hospital Association Regions Region ID and State	Frequency	Percent	Cumulative Frequency	Cumulative Percent
3: DE, KY, MD, NC, VA, WV, DC	1	1	7	8.1
4: AL, FL, GA, MS, SC, TN, PR	9	11	16	18.6
5: IL, MI, IN, OH, WI	13	15	29	33.7
6: IA, KS, MN, MO, NE, ND, SD	14	16	43	50.0
7: AR, LA, OK, TX	28	33	71	82.6
8: AZ, CO, ID, MT, NM, UT, WY	8	9	79	91.9
9: AK, CA, HI, NV, OR, WA	7	8	86	100.0

Table 4. 3. Hospital Demographics, Press Ganey Associates, Inc. 2012 Survey Data

Variable	Missing Data	Mean	Std. Dev.	Min.	Max.
Licensed Beds	0	244.66	196.29	18	866
Staffed Beds	5	206.67	186.87	18	1,112
Vacancy Nurse	21	8.75	11.51	0	85
Private Rooms	31	134.22	164.83	0	587
Semi-private Rooms	39	62.74	98.21	0	490
Number of FTE	15	907.34	1,039.49	12	4,442
Occupancy	51	59.26	17.52	25	93
Annual Discharges	43	7,568.05	6,036.69	178	23,881
% Males	51	40.06	6.70	30	62
% Females	51	59.94	6.70	38	70
% ER Admits	52	44.94	15.69	13	93
% Scheduled Admits	65	34.19	18.29	5	75
% Pre -Admits	67	43.53	29.80	5	95

Table 4. 4. Hospital Demographics, Press Ganey Associates, Inc. 2012 Survey Data

Valid/Missing	Demographic Characteristics	Frequency	Percent	Cumulative Frequency	Cumulative Valid Percent
		Critical Access Hospital			
Valid	Yes	2	2.33	2	15.38
	No	11	12.79	13	100.00
Missing		73	84.88	86	
		Unionized Nursing Aides			
Valid	Yes	10	11.63	10	12.5
	No	55	63.95	65	81.25
	N/A	15	17.44	80	100.00
Missing		6	6.98	86	
		Nursing staff represented by a union			
Valid	Yes	13	15.12	13	16.25
	No	52	60.47	65	81.25
	N/A	15	17.44	80	100.00
Missing		6	6.98	86	
		Unionized Nursing Extenders			
Valid	Yes	3	3.49	3	3.80
	No	47	54.65	50	63.29
	N/A	29	33.72	79	100.00
Missing		7	8.14	86	
		Unionized House staff			
Valid	Yes	1	1.16	1	1.25
	No	53	61.63	54	67.50
	N/A	26	30.23	80	100.00
Missing		6	6.98	86	
		Unionized_LPNs			
Valid	Yes	10	11.63	10	12.66
	No	51	59.30	61	77.22
	N/A	18	20.93	79	100.00
Missing		7	8.14	86	
		Unionized Physicians			
Valid	Yes	7	8.14	7	8.75
	No	57	66.28	64	80.00
	N/A	16	18.60	80	100.00
Missing		6	6.98	86	
		Type of control/sponsorship			
Valid	Tax exempt (faith-based Not-for-Profit)	35	40.70	35	43.75
	Tax exempt (non-faith-	27	31.40	62	77.50

Valid/Missing	Demographic Characteristics	Frequency	Percent	Cumulative Frequency	Cumulative Valid Percent
	based Not-for-Profit)				
	Government (non-federal)	9	10.47	71	88.75
	Proprietary (Investor Owned)	9	10.47	80	100.00
Missing		6	6.98	86	
	University Affiliated				
Valid	yes	10	11.63	10	15.38
	no	55	63.95	65	100.00
Missing		21	24.42	86	
	Teaching Hospital with Residents				
Valid	yes	9	10.47	9	14.29
	no	54	62.79	63	100.00
Missing		23	26.74	86	
	Non-teaching Hospital				
Valid	yes	59	78.67	59	78.67
	no	16	21.33	75	100.00
Missing		11	14.67	86	
	Member of University Health System Consortium				
Valid	N	12	13.95	12	80.00
	Y	3	3.49	15	100.00
Missing		71	82.56	86	
	Magnet Hospital				
Valid	N	11	12.79	11	73.33
	Y	4	4.65	15	100.00
Missing		71	82.56	86	
	Size of Community				
Valid	Large City	19	22.09	19	23.75
	Suburb of City	13	15.12	32	40.00
	Small City	18	20.93	50	62.50
	Rural/town	30	34.88	80	100.00
Missing		6	6.98	86	
	Size of Population in the Service Area				
Valid					
Large City	over 1 million	9	10.47	9	20.00
	500,000 - 1 million	4	4.65	13	28.89
	250,000 - 499,999	4	4.65	17	37.78

Valid/Missing	Demographic Characteristics	Frequency	Percent	Cumulative Frequency	Cumulative Valid Percent
Suburb of City	greater than 500,000	5	5.81	22	48.89
	250,000 - 500,000	3	3.49	25	55.56
	100,000 - 249,999	1	1.16	26	57.78
	50,000-99,999	2	2.33	28	62.22
	less than 50,000	17	19.77	45	100.00
Missing		41	47.67	86	

4.3.2. Patient demographic profile

Appendices 4.9 and 4.10 depict demographic characteristics of the 117,116 adult patients in 86 hospitals participating in the Press Ganey inpatient survey. Patients under 18 years old were excluded from the study. As Appendix 4.09 indicates, the average age of patients participating in the survey was 60. Appendix 4.10 presents the frequencies which summarize patients' responses to various demographic survey items.

4.3.3. Employee demographic profile

Appendix 4.11 depicts a demographic description of nurses in the 86 hospitals participating in the Press Ganey (PG) Employee Partner (EP) Survey. Appendix 4.11 presents the frequencies and percent distributions which summarize participants' responses to the items which asked them to describe their positions. Data from 27,272 participants are represented.

4.3.4. Physician demographic profiles

Appendices 4.12 to 4.14 depict data from 7,104 physician demographic profiles in 86 hospitals participating in the Press Ganey physician survey. The Appendices present the

frequencies and percentages which summarize participants' responses to the demographic survey items.

4.4. Survey Item Means of Initial Major Study Variables

As part of the purpose of this study, this set of data was intended to describe survey item means which could influence the study variables of interest. Tables 4.5 to 4.7 illustrate survey item means and standard deviations of major study variables for inpatients, nursing, and physicians. The mean is the average of the item values reported. Standard deviations provide information about the variation within the sample: smaller standard deviations suggest that most values are close to the mean. Discussions of what each stakeholder group is most and least satisfied with are also included below.

4.4.1. Survey item means of initial inpatient perspective measurements (three variables; 22 survey items)

Table 4.5 depicts survey item means for the 117,116 adult patients in 86 hospitals participating in the Press Ganey inpatient survey. The Table presents the means and standard deviations, which summarize patients' responses to various inpatient satisfaction survey items. The survey results identify areas in which patients were most and least satisfied during their inpatient stay. Friendliness/courtesy of the nurses and skill of physicians were areas that patients were most satisfied with, while patients were least satisfied with the speed of the discharge process.

Table 4. 5. Survey Item Means of Three Initial Patient Perspective Measurements: Patient Perceptions of Nursing Care, Patient Perceptions of Physician Care, and Patient Overall Satisfaction with the Hospital, Press Ganey Associates, Inc. 2012 Survey Data, N=86

Variable Label	Item	Mean	Std. Dev.
Patient Perceptions of Nursing Care: 13 Items			

Variable Label	Item	Mean	Std. Dev.
N1	Friendliness/courtesy of the nurses	92.82	14.76
N2	Promptness in responding to the call button	86.96	19.62
N3	Nurses' attitude toward your requests	90.33	17.14
N4	Amount of attention paid to your special or personal needs	89.02	18.46
N5	How well the nurses kept you informed	88.28	18.76
N6	Skill of the nurses	91.83	15.54
D1	Staff concern for your privacy	88.82	16.83
D3	How well your pain was controlled	87.78	18.37
PI1	Degree to which hospital staff addressed your emotional needs	86.59	19.28
PI2	Response to concerns/complaints made during your stay	86.21	20.29
PI3	Staff effort to include you in decisions about your treatment	86.41	19.86
PI4	Speed of discharge process after you were told you could go home	82.14	23.63
PI5	Instructions given about how to care for yourself at home	87.56	19.79
Patient Perceptions of Physician Care: 6 Items			
P1	Time physician spent with you	83.57	21.19
P2	Physician's concern for your questions and worries	87.25	19.53
P3	How well physician kept you informed	86.37	20.72
P4	Friendliness/courtesy of physician	90.28	17.25
P5	Skill of physician	92.31	15.63
D1	Extent to which you felt ready to be discharged	87.00	19.42
Patient Overall Satisfaction with the Hospital: 3 Items			
OA1	How well staff worked together to care for you	90.71	16.82
OA2	Likelihood of your recommending this hospital to others	89.99	19.68
OA3	Overall rating of care given at hospital	90.92	17.37

4.4.2. Survey item means of initial nursing perspective measurements (three variables; 39 survey items)

Table 4.6 depicts survey item means of the 86 hospitals participating in the Press Ganey (PG) Employee Partner (EP) Survey. The Table presents the means and standard deviations, which summarize participants' responses to the EP survey items. Data from 27,272 participants are represented. The survey results identify areas in which nurses were most and least satisfied within their workplace. Two areas that nurses were most satisfied

with were: meaningful work and their plan to continue working for the same organization one year from now; staffing and workgroup input were the areas of least satisfaction.

Table 4. 6. Survey Item Means of Three Initial Nursing Perspective Measurements: Nursing Satisfaction, Nursing Staff Work Engagement, and Nursing Staff's Perceptions of Management Support, Press Ganey Associates, Inc. 2012 Survey Data, N=86

Variable Label	Item	Mean	Std. Dev.
Nursing Staff Work Engagement: 11 Items			
OW1	Employees in my work group regularly express their concerns and suggestions about our work.	76.86	22.44
OW2	Our employees do everything they can to provide high quality service.	78.79	23.24
OW3	Employees in my work group are fully attentive to the needs of others.	73.74	25.11
OW4	Employees in my work group report a strong sense of connection to their work.	74.18	24.89
OW5	Employees in my work group do everything they can to make this organization successful.	75.22	24.72
OO1	I plan to be working for this organization one year from now.	83.32	23.86
OO2	I would recommend the healthcare services provided here to my friends and relatives.	79.27	25.22
OO5	I would recommend this organization to a friend as a great place to work.	74.35	28.14
OO3	I believe the quality of care here is excellent.	76.94	24.89
OO4	I think this organization is highly regarded in the community.	73.86	27.02
OO6	The values of this organization are evident in our everyday practices.	74.61	25.83
Nursing Staff's Perceptions of Management Support: 26 Items			
SL1	Leaders do a good job of communicating major developments.	69.08	28.10
SL2	Leaders really listen to employees.	61.68	30.39
SL3	Leaders do a good job of planning for the future.	65.20	28.91
SL4	As long as I perform well, this organization will try to find a place for me.	69.53	27.53
SL5	My work group is asked for opinions before decisions are made.	55.51	31.81
SL6	I have opportunities to influence policies and decisions that affect my work.	58.26	31.22
SL7	Excellent performance is recognized here.	64.07	30.49
SL8	Compared to other healthcare organizations my pay is fair.	60.48	30.13
RE1	There is adequate staffing in my work group.	55.06	32.81
RE2	I have the equipment I need to do my job well.	67.49	28.38
RE3	Physical conditions (light, heat, space, appearance) in my area are good.	69.06	29.08
DM1	My last performance review helped me improve.	69.40	26.76
DM2	My direct manager provides coaching to help me achieve my goals.	68.70	30.07
DM3	My direct manager recognizes my ideas or suggestions for improvement.	70.66	29.74
DM4	My direct manager communicates effectively.	69.98	30.85

Variable Label	Item	Mean	Std. Dev.
DM5	My direct manager can be trusted.	72.46	30.58
DM6	It is easy to talk to my direct manager about things that go wrong on my job.	72.56	30.83
DM7	My direct manager recognizes my good work.	73.34	29.28
TW1	There is good coordination of effort in my work group.	72.94	26.52
TW2	Members of my work group treat one another with dignity and respect.	72.78	27.39
MW1	My work gives me a feeling of accomplishment.	80.35	23.03
MW2	My work makes good use of my skills and abilities.	79.90	23.55
MW3	My work provides me an opportunity to be creative and innovative.	71.87	27.14
MW4	I am given opportunities for ongoing education and professional development.	70.08	29.28
MW5	My work is meaningful.	84.32	20.87
OW6	Employees who work here are seldom distracted from their work.	64.04	27.73
Nursing Satisfaction: 2 Items			
MW6	Overall, I am satisfied with my job.	76.49	25.09
OO7	Overall, I am satisfied with this organization.	73.85	26.45

4.4.3. Survey item means of initial physician perspective measurements (three variables; 25 survey items)

Table 4.7 depicts survey item means of the 86 hospitals participating in the Press Ganey physician partnership survey. The Table presents the means and standard deviations, which summarize participants' responses to the physician partnership survey items. Data from 7,104 participants are aggregated into the 86 hospital groups. The survey results identify areas in which physicians were most and least satisfied with hospital structure and processes. Two areas that physicians were most satisfied with were: 1. Staff's concern for and interest in their patients and; 2. Their plan to continue their level of admissions to, or procedures/surgeries at, this facility over the next year; degree to which physicians are involved in decision making at this facility was the area of least satisfaction.

Table 4. 7. Survey Item Means of Three Initial Physician Perspective Measurements: Physician Satisfaction, Physicians' Perceptions of Quality of Care, and Physicians' Perceptions of Management Support, Press Ganey Associates, Inc. 2012 Survey Data, N=86

Variable Label	Item	Mean	Std. Dev.
Physician Perceptions of Management Support: 19 Items			
QPC1	Staff's concern for and interest in your patients	82.05	18.87
QPC2	Staff's knowledge of patients' conditions and courses of treatment	74.88	21.12
QPC3	Staff's reliability in recognizing and reporting changes in patients' conditions	75.69	20.86
QPC4	Timeliness of follow-through on orders	74.02	22.20
QPC5	Quality of nursing staff	77.33	20.52
QPC6	Overall rating of physician-nurse collaboration	77.14	20.71
QPC7	Access to patient information (e.g., availability of nurse assigned to patient, chart, test results)	74.99	22.97
EPF1	Ease of admitting patients	76.88	22.05
EPF2	Ease of scheduling inpatient tests/therapy	77.63	20.82
EPF3	Ease of scheduling outpatient tests/therapy	74.08	22.82
EPF4	Ease of scheduling outpatient surgery	75.20	22.65
EPF5	Turnaround for lab results	77.41	20.90
EPF6	Turnaround for radiology results	79.87	20.29
CC1	Visibility/Accountability of Hospital Administration	71.54	26.03
CC2	Communication between yourself and Hospital Administration	70.61	27.25
CC3	Responsiveness of Hospital Administration to ideas and needs of the medical staff	65.54	28.54
CC4	Degree to which physicians are involved in decision making at this facility	61.57	29.09
CC5	Degree to which Hospital Administration seeks mutually beneficial solutions to physicians' issues	64.38	29.06
CC6	Degree to which you are interested as a valued member to this facility's medical staff	68.20	28.99
Physician Perceptions of Quality of Care: 2 Items			
SA2	Degree to which this facility makes caring for your patients easier	73.29	23.69
SA1	Overall quality of care at this facility	79.16	19.70
Physician Satisfaction: 4 Items			
FA1	Likelihood that you will maintain your level of admissions to, or procedures/surgeries at, this facility over the next year	82.16	22.59
FA2	Likelihood you would recommend this facility to other physicians	78.63	24.72
FA3	Likelihood you would recommend this facility to friends and family for care	77.46	26.35
SA3	Overall satisfaction with this facility	76.42	16.81

4.5. An Overview of the Results of This Investigation

This investigation followed a two-step approach recommended by Anderson and Gerbing (1988): the researcher first developed an acceptable measurement model, followed by analyses of paths in this study's mediational hypotheses. As a model is a statistical statement about the relationships among variables, this study's theoretical model can be divided into two parts based on the types of relationships. The relationships between measured variables (survey items) to the latent variables (scales) is a measurement model and the relationship among our scales / latent variables is a structural model.

This investigation examined the relationships between measured variables (survey items) to the latent variables (scales) and summarized the statistical results of an acceptable measurement model that it developed (e.g., the fit indices, factor loadings, and composite reliability estimates) in sections 4.06 through 4.08. As the researcher strikes out in new intellectual directions since there is little guidance from theories available, the initial framework (illustrated in Figure 3.01, Chapter 3) serves as an initial guide to this study's scale development (DeVellis, 2017) and measurement model fit. During the measurement model development process, elimination of some scales and survey items led to scale length reduction, scale name revisions, conceptual framework modification, and subsequently mediational hypotheses revisions.

After developing an acceptable measurement model, the researcher examined the structural model - the relationships among this study's scales / latent variables - and presented testing results for this study's revised mediational hypotheses of the structural model in sections 4.09 and 4.10.

4.6. Testing Results of Measurement Model Fit

4.6.1. Number of factors to extract

To determine a sufficient number of factors for extraction, this study evaluated the eigenvalues (Kaiser, 1960) and the scree plots / test (Cattell, 1966). The eigenvalues-greater-than-one rule proposed by Kaiser (1960) and scree plots revealed factor structures for each survey instrument as displayed in Table 4.8 and Appendices Tables 4.15 to 4.20. For results of item-item correlations of each survey and initial factor patterns of the Null Model, please see Appendices Tables 4.21 to 4.26.

Table 4. 8. Number of Factors Suggested by Eigenvalues and Scree Plots from an Initial Factor Analysis for the Null Model

	Eigenvalues	Scree Plots
Employee Partnership Survey (39 items; see Appendices Tables 4.18 and 4.19)	4	3
Physician Partnership Survey (25 items; see Appendices Tables 4.20 and 4.21)	3	3
Inpatient Survey (22 items; see Appendices Tables 4.22 and 4.23)	2	3
Total Number of Factors	9	9

4.6.2. Measurement model development

As informed by scree plots and guided by the initial framework, this study considered that the purpose of the scales should reflect the nature of the latent variables of interest and should measure relevant latent variables. The Press Ganey (PG) validated survey instruments are a rich source from which the scales can emerge. This study constructed new scales based on literature review, informed decisions from expert opinions, experiences in the industry, scree plots (Cattell, 1966), factor analyses (Hatcher, 1994), the content of survey items,

examination of item means, and inspection of correlation matrices to confirm that the concepts were suitable for this study.

As the acceptable values of factor loadings, the level of fitness indexes, and the methods of modification to the measurement model varies across the literature, the researcher researched and applied recommendations suitable for small sample sizes to develop an acceptable measurement model that would fit our data. Such considerations enabled this study to reorganize and reclassify a substantial amount of survey items into a more manageable set of meaningful categories for this study, i.e., each of these reclassifications resulted in a few ideas that captured much of what the many individual survey items covered. Below are steps (developed through our trial and error approach) that the researcher applied to develop an acceptable measurement model based on the study's small sample size, (i.e., scale revision/reduction).

1. Run factor analysis.
2. Examine fit indexes obtained for the measurement model and compare against acceptable levels.
3. When the indexes obtained did not achieve the acceptable level, the researcher applied the following strategies to reduce the number of variables in the model:
    a. Conduct orthogonal factor rotations to obtain the factor loading matrix, examine and identify the factor loading for every item in each scale. Items having relatively lower factor loadings were eliminated. The researcher also eliminated items that were either cross-loading or low-loading and retained factor loadings that were large enough so that the factors had a meaningful effect on the variables of interest.

b. Raise cutoffs for meaningful factor loadings:
    i. The researcher examined the factor loading matrices against the guidelines for factor loadings of ± 0.55 recommended by Hair et.al. (1998, pg. 111) for practical significance.
    ii. In consideration for the sample size of 86 hospitals, using a factor loading of ± 0.60 is also appropriate for this study (Hair et.al.,1998, pg. 112).
    iii. The researcher also considered "rules of thumb" based on sample size for statistical significance by Stevens (2003, pg. 294) who recommended factor loadings of ±0.722 for sample sizes around 50 to 100.
c. Examine the Cronbach's alpha reliability coefficient (standardized variable for small sample size) for each scale. The researcher removed items with the lowest item-total correlation value and items that could improve Alpha if deleted. Items with low item-total correlation value that were not measuring the same construct as the rest of the items in the scale were measuring were thus deemed for deletion. This study aimed to retain scales with standardized composite reliability between 0.81 and 0.93 and to avoid the risk of an inefficient level of redundancy in the scale items ($\alpha > 0.95$).
d. Eliminate items with low communality (<0.7). MacCallum et al. (1999, 2001) advocate that all items in a factor model should have an average

communality of 0.7 to justify performing a factor analysis with small sample sizes.

e. Conduct *t*-tests for the equality of means (once) to find significant differences between the means of high scorers (in the highest 25 percentile) and low scorers (in the lowest 25 percentile) on the scale (Cooper & Schindler, 2003). The researcher eliminated items with a significance (p value) greater than 0.05, which are believed not to add further insight to the construct (Cooper & Schindler, 2003).

f. Examine item – rest correlations and remove items that have lower correlations with most of the items in the scale

g. Remove items no longer relevant to the scale conceptually.

4. Run this new measurement model (the model after items are deleted).

5. Examine the Fitness Indexes – repeat steps 1 to 4 until the fitness indexes are achieved.

4.6.3. Assessing measurement model fit

As previously mentioned, each measurement model was evaluated according to the fit indices. For the small sample size, this investigation utilized three applicable fit indices: Standardized Root Mean-square Residual (SRMR), Non-Normed-fit index (NNFI) / Tucker-Lewis Index (TLI), and the Comparative Fit Index (CFI). The researcher stopped the measurement fit testing when the fitness indices reached an acceptable range. Table 4.9 illustrates the results of each measurement model that this study tested, including measurement model # 6 that reached all acceptable levels of the fit indices.

Table 4. 9. Fit Indices for the Measurement Models, N=86

Measurement Models	# of Scales vs. # of Items	SRMR (< 0.09)	NNFI / TLI (> 0.8)	CFI (> 0.9)
Null	9: 69	0.153	0.531	0.551
1	9: 60	0.203	0.202	0.245
2	8: 48	0.127	0.664	0.641
3	6: 40	0.076	0.671	0.693
4	8: 25	0.076	0.79	0.824
5-A	6: 18	0.061	0.837	0.868
5-B	8: 16	0.117	0.855	0.902
5-C	7: 14	0.114	0.862	0.908
6	**6: 12**	**0.062**	**0.884**	**0.924**

4.6.4. Reliability of Final Measurement Model

The researcher assessed scale reliability with Cronbach's / coefficient alpha for each scale in this study's final measurement model (#6: 6 scales and 12 items). All the scales appeared to have high internal consistency reliabilities, including an α range from 0.831573 to 0.930178 (standardized) (Eisinga, Grotenhuis, & Pelzer, 2013; Gliem & Gliem, 2003). Within each scale, all the corresponding items correlate well with the scale - none of the items has a correlation value less than 0.2 (Everitt, 2002) or 0.3 (Field, 2013). Table 4.10 lists reliability, validity, and other psychometric properties of this study's final measurement model.

Table 4. 10. Reliability, Validity, and Other Psychometric Properties of the Latent Factors and Manifest Indicator Variables that Constitute the Revised Measurement Model, N=86

	Results for Indicators (Items)			Results for Composites (Scale)
Factors and Indicators	Standardized Loading	*t* statistics	Correlation with the Scale	Composite Reliability (Standardized)
Nursing perceptions of management support				0.83
DM3: My direct manager recognizes my ideas or suggestions for improvement	0.84	20.1*	0.71	

Factors and Indicators	Results for Indicators (Items)			Results for Composites (Scale)
	Standardized Loading	*t* statistics	Correlation with the Scale	Composite Reliability (Standardized)
DM4: My direct manager communicates effectively	0.85	6.0*	0.71	
Nursing work Satisfaction				0.90
OO3: I believe the quality of care here is excellent	0.80	11.4*	0.82	
OO5: I would recommend this organization to a friend as a great place to work.	0.77	10.4*	0.82	
Physician perceptions of administration support				0.87
CC2: Communication between yourself and Hospital Administration	0.85	24.1*	0.77	
CC5: Degree to which Hospital Administration seeks mutually beneficial solutions to physicians' issues	0.87	21.6*	0.77	
Physician perceptions of nursing quality				0.89
QPC5: Quality of the nursing staff	0.81	16.4*	0.80	
QPC6: Overall rating of physician-nurse collaboration	0.78	17.4*	0.80	
Patient perceptions of nursing care				0.91
N3: Nurses' attitude toward your requests	0.86	9.1*	0.83	
N4: Amount of attention paid to your special or personal needs	0.86	9.9*	0.83	

Factors and Indicators	Results for Indicators (Items)			Results for Composites (Scale)
	Standardized Loading	*t* statistics	Correlation with the Scale	Composite Reliability (Standardized)
Patient perceptions of physician care				0.93
P2: Physician's concern for your questions and worries	0.89	10.4*	0.87	
P3: How well physician kept you informed	0.87	10.2*	0.87	

*p < .0001

4.7. Bivariate Correlation Analyses Results for Latent Variables of Final Measurement Model

The researcher conducted bivariate correlational analyses among the latent variables in the revised conceptual framework to understand the relationships among them. The latent variables under investigation included: nurse perceptions of management support, nursing staff work satisfaction, patient perceptions of nursing care, patient perceptions of physician care, physician perceptions of nursing quality, and physician perceptions of administration support. Pearson correlation coefficients were computed among these scales on data for the 86 participating hospitals.

This study's analysis results suggest that variables of interest were correlated which indicate strong, positive relationships among them. According to criteria provided by Cohen (1988), the size of all the correlations suggest medium to large effects, ranging from 0.37 to 0.80. These findings are consistent with the positive relationships that were evident in the correlational matrices during the scale creation and in this study's conceptual model. See Figure 4.1 and Appendix Table 4.27 for correlation coefficients between variables and Table 4.11 for latent variable means. For example, nursing perceptions of management support is

correlated with nursing staff satisfaction; higher scores on nursing staff satisfaction are associated with higher scores on nursing perceptions of management support ($r = 0.80$, $p < 0.0001$).

4.8. Resulting Framework for Hypothesis Testing

Figure 4. 1. Resulting Framework for Hypothesis Testing and Correlation Coefficients between Latent Variables

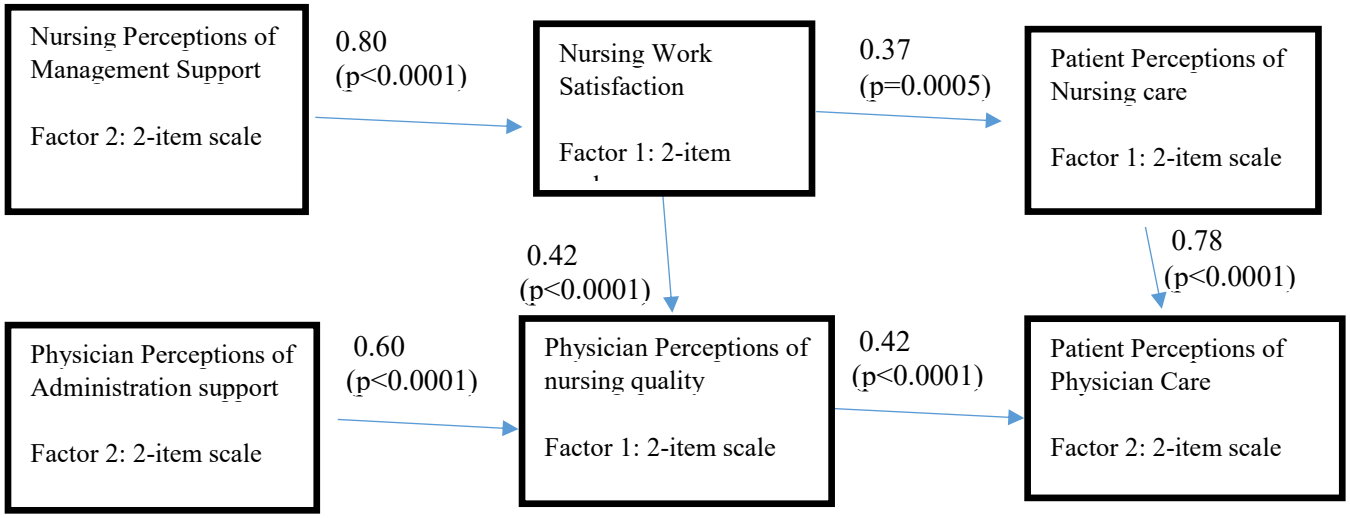


Table 4. 11. Means of Latent Variables and Survey Items (Indicators), Press Ganey Associates, Inc. 2012 Survey Data, N=86

Latent Variable & Survey Item	Mean	Std. Dev.
Nursing Perceptions of Management Support	71.47	7.57
Nursing Work Satisfaction	76.62	9.39
Physician Perceptions of Administration Support	68.86	11.20
Physician Perceptions of Nursing Quality	79.26	6.95
Patient Perceptions of Nursing Care	89.43	3.75
Patient Perceptions of Physician Care	87.03	3.58

4.9. Testing Results for Revised Meditation Hypotheses

The researcher used structural equation modeling to model the hypothetical pathway for each hypothesis, i.e., mediation analysis to identify the mediator(s) on the causal pathway from predictor variable and outcome variable and to estimate the mediation effect of the mediator between the predictor variable and outcome variable. The researcher used the bootstrap approach for testing the indirect effect. The non-bias-corrected bootstrap approach produces preferable confidence limits and standard errors for the indirect effect test (Fritz, Taylor, & MacKinnon, 2012).

Note: 1. The mediation effect is also called the indirect effect. 2. For correlation coefficients between scales, please see Appendix 4.27.

Hypothesis 1.a: The association between nursing staff's positive perceptions of management support and higher patient perceptions of nursing care is mediated by higher nursing satisfaction.

Predictor variable: Nursing Perceptions of Management Support

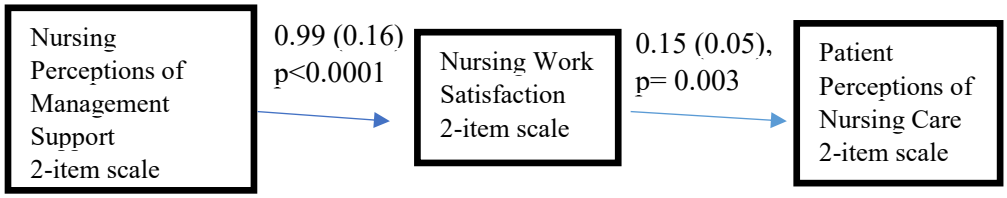
Mediator variable: Nursing Work Satisfaction

Outcome variable: Patient Perceptions of Nursing Care

Testing results of Hypothesis 1.a

Mediation analysis was used to investigate Hypothesis 1.a as a pathway in Figure 4.02.

Figure 4. 2. Hypothesis 1.a Pathway



The results supported our mediation Hypothesis 1.a.

a. Nursing perceptions of management support's specific indirect effect on patient perceptions of nursing care was tested using bootstrapped standard errors and was significant (β = 0.15, 95% CI [0.07, 0.28], SE = 0.05, p = 0.007), which suggested that nursing perceptions of management support indirectly affects patient perceptions of nursing care.
    i. Partial mediation: Approximately 62.50% of the variance in patient perceptions of nursing care was accounted for by the predictor - nursing perceptions of management support. Nursing perceptions of management support was associated with approximately 15% higher patient perceptions of nursing care as mediated by nursing satisfaction.
    ii. Nursing work satisfaction is a significant mediator.

Hypothesis 1.b: The association between nursing staff's positive perceptions of management support and higher patient perceptions of physician care is mediated by two mediators: higher nursing work satisfaction and higher patient perceptions of nursing care.

Predictor variable: Nursing Perceptions of Management Support

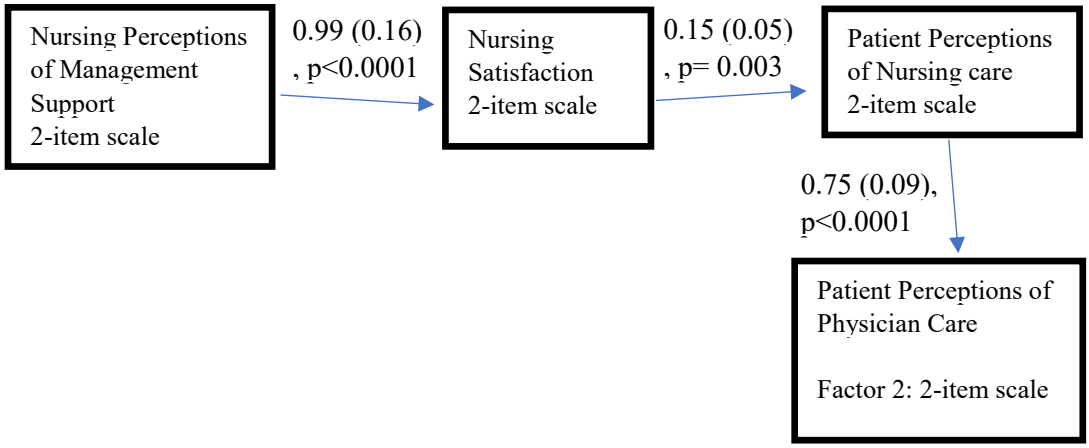
Mediator variables: Nursing Work Satisfaction and Patient Perceptions of Nursing Care

Outcome variable: Patient Perceptions of Physician Care

Testing results of Hypothesis 1.b

Mediation analysis was used to investigate Hypothesis 1.b as a pathway in Figure 4.03.

Figure 4. 3. Hypothesis 1.b Pathway



Results supported our mediation Hypothesis 1.b.

a. Nursing perceptions of management support's specific indirect effect on patient's perceptions of physician care was tested using a bootstrapped approach and standard errors were significant (β = 0.11, 95% CI [0.05, 0.22], SE = 0.04, p = 0.012), which suggests that nursing perceptions of management support indirectly affects patient perceptions of physician care.

    i. Partial mediation: Approximately 64.71% of the variance in patient perceptions of nursing care was accounted for by the predictor - nursing perceptions of management support. Nursing perceptions of management support was associated with approximately 11% higher patient perceptions

of physician care as mediated by nursing satisfaction and patient perceptions of nursing care.

ii. Nursing work satisfaction's specific indirect effect on patient perceptions of physician care was tested using a bootstrapped approach and standard errors were significant (β = 0.11, 95% CI [0.05, 0.20], SE = 0.04, p = .006).

iii. Both nursing work satisfaction and patient perceptions of nursing care are significant mediators.

Hypothesis 2.a: The association between nursing staff's positive perceptions of management support and higher physician perceptions of nursing quality is mediated by higher nursing satisfaction.

Predictor variable: Nursing Perceptions of Management Support

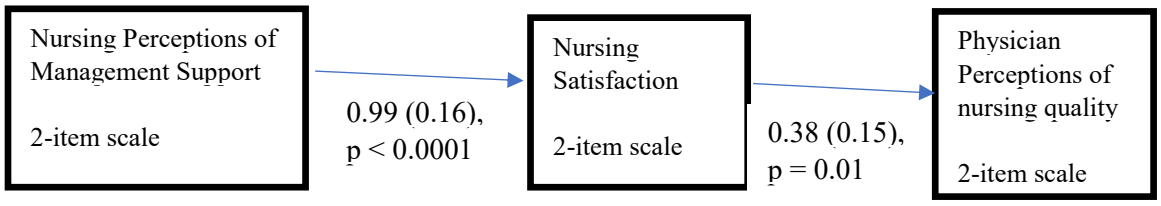
Mediator variables: Nursing Work Satisfaction

Outcome variable: Physician Perceptions of Nursing Quality

Testing results of Hypothesis 2.a

Mediation analysis was used to investigate Hypothesis 2.a as a pathway in Figure 4.4.

Figure 4. 4. Hypothesis 2.a Pathway



Results supported our mediation Hypothesis 2.a.

a. Nursing perceptions of management support's specific indirect effect on physician perceptions of nursing quality was tested using a bootstrapped approach and the standard

error was significant (β= 0.37, 95% CI [0.13, 0.85], SE=0.19, p=0.05), which suggested that nursing perceptions of management support indirectly affects physician perceptions of nursing quality.

i. Full mediation: Approximately 80.43% of the variance in physician perceptions of nursing quality was accounted for by the predictor - nursing perceptions of management support. Nursing perceptions of management support was associated with approximately 37% higher physician's perceptions of nursing quality as mediated by nursing satisfaction.

ii. Nursing work satisfaction is a significant mediator.

Hypothesis 2.b: The association between nursing staff's positive perceptions of management support and higher patient perceptions of nursing care is mediated by three mediators: higher nursing work satisfaction, higher physician perceptions of nursing quality, and higher patient perceptions of physician care.

Predictor variable: Patient Perceptions of Physician Care

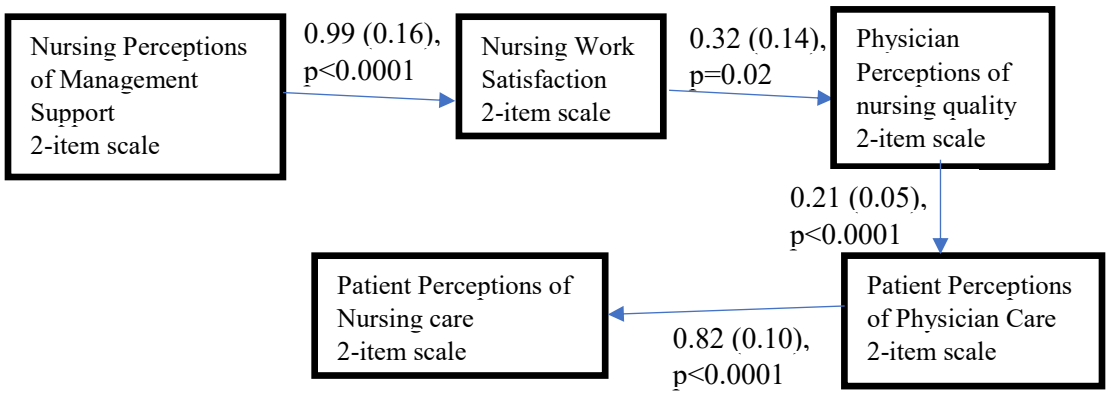
Mediator variables: Physician Perceptions of Nursing Quality, Nursing Perceptions of Management Support, and Nursing Work Satisfaction

Outcome variable: Patient Perceptions of Nursing Care

Testing results of Hypothesis 2.b

Mediation analysis was used to investigate Hypothesis 2.b as a pathway in Figure 4.05.

Figure 4. 5. Hypothesis 2.b Pathway



Results did not support our mediation Hypothesis 2.b.

a. Nursing perceptions of management support's specific indirect effect on patient's perceptions of nursing care was tested using bootstrapped standard errors and was not significant (β = 0.06, 95% CI [0.02, 0.15], SE = 0.03, p = 0.11).
b. Nursing perceptions of management support's specific indirect effect on physician perceptions of nursing quality was tested using bootstrapped standard errors and was significant (β = 0.32, 95% CI [0.10, 0.67], SE = 0.15, p = 0.03).
c. Nursing perceptions of management support's specific indirect effect on patient's perceptions of physician care was tested using bootstrapped standard errors and was not significant (β = 0.07, 95% CI [0.02, 0.16], SE = 0.04, p = 0.08).
d. Nursing satisfaction's specific indirect effect on patient's perceptions of nursing care was tested using bootstrapped standard errors and was not significant (β = 0.06, 95% CI [0.01, 0.13], SE = 0.03, p = 0.09).
e. Nursing satisfaction's specific indirect effect on patient's perceptions of physician care was tested using bootstrapped standard errors and was not significant (β = 0.07, 95% CI [0.02, 0.15], SE = 0.04, p = 0.06).

f. Physician perceptions of nursing quality's specific indirect effect on patient's perceptions of nursing care was tested using bootstrapped standard errors and was significant (β = 0.17, 95% CI [0.08, 0.29], SE = 0.05, p = 0.001).

Hypothesis 3: The association between physicians' positive perceptions of administration support and higher patient perceptions of physician care is mediated by higher physician perceptions of nursing quality.

Predictor variable: Physician Perceptions of Administration Support

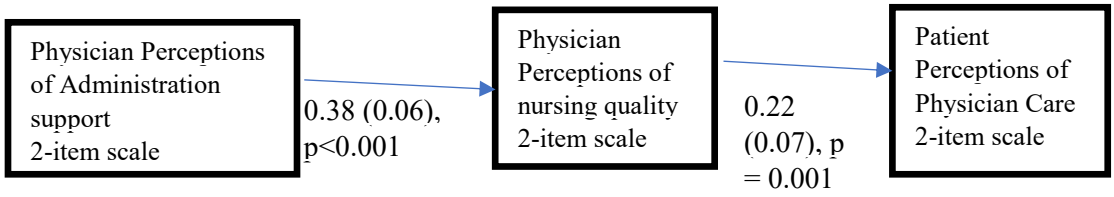
Mediator variable: Physician Perceptions of Nursing Quality

Outcome variable: Patient Perceptions of Physician Care

Testing results of Hypothesis 3

Mediation analysis was used to investigate Hypothesis 3 as a pathway in Figure 4.6.

Figure 4. 6. Hypothesis 3 Pathway



Results supported our mediation Hypothesis 3.

a. Physician perceptions of administration support's specific indirect effect on patient perceptions of physician care was tested using bootstrapped standard errors and was significant (β = 0.08, 95% CI [0.04, 0.16], SE = 0.03, p = 0.003), which suggests that physician perceptions of administration support indirectly affects patient perceptions of physician care.

   i. Full mediation: Approximately 89% of the variance in patient perceptions of physician care was accounted for by the predictor - physician perceptions of

administration support. Each unit increase of physician perceptions of administration support was associated with approximately 8% higher patient perceptions of physician care as mediated by physician perceptions of nursing quality.

ii. Physician perceptions of nursing quality is a significant mediator.

Alternate Pathway to Hypothesis 3: The association between nursing staff's positive perceptions of management support and higher patient perceptions of physician care is mediated by two mediators: higher nursing work satisfaction and higher physician perceptions of nursing quality.

Predictor variable: Nursing Perceptions of Management Support

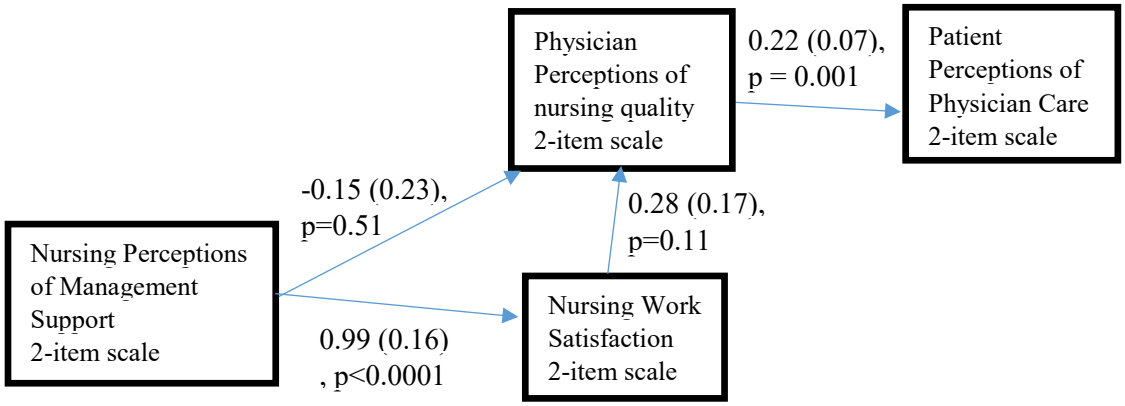
Mediator variables: Nursing Work Satisfaction and Physician Perceptions of Nursing Quality

Outcome variable: Patient Perceptions of Physician Care

Testing results of alternate pathway of Hypothesis 3

Mediation analysis was used to investigate an alternate pathway of Hypothesis 3 as in Figure 4.7.

Figure 4. 7. Alternate Pathway for Hypothesis 3



Results did not support the alternate pathway to mediation Hypothesis 3.

a. Nursing perceptions of management support's specific indirect effect on patient's perceptions of physician care was tested using bootstrapped standard errors and was not significant (β = 0.06, 95% CI [0.004, 0.20], SE = 0.05, p = 0.24).

4.10. Evaluation Results of the Structural Model

This investigation used SEM to determine whether hypothesized relationships exist among the constructs. Summaries of the results are in Tables 4.12 and 4.13.

Table 4. 12. Results of Standardized Regression Weights for the Model: Hypothesized Path Direct Effects, N=86

The Relationships between Variables	Coefficient (β)	Standardized Estimate (SE)	P-value	Results	
Nursing Perceptions of Mgmt. Support ➔ Nursing Work Satisfaction	0.99	0.16	<0.0001	Significant	Accept
Nursing Work Satisfaction ➔ Patient Perceptions of Nursing Care	0.15	0.05	0.003	Significant	Accept
Patient Perceptions of Nursing Care ➔ Patient Perceptions of Physician Care	0.75	0.09	<0.0001	Significant	Accept
Nursing Work Satisfaction ➔ Physician Perceptions of Nursing Quality	0.38	0.15	0.01	Significant	Accept
Physician Perceptions of Administration Support ➔ Physician Perceptions of Nursing Quality	0.38	0.06	<0.001	Significant	Accept
Physician Perceptions of Nursing Quality ➔ Patient Perceptions of Physician Care	0.22	0.07	0.001	Significant	Accept
Patient Perceptions of Physician Care ➔ Patient Perceptions of Nursing Care	0.82	0.10	<0.0001	Significant	Accept

Table 4. 13. Results of Standardized Regression Weights for the Model: Hypothesized Path Indirect Effects, N=86

H	Predictor (Exogenous)	Mediator(s)	Outcome (Endogenous)	β	SE	P-value	Results	VAF & Nature of Mediation*
1.a	Nursing Perceptions of Mgmt. Support	➔ Nursing Work Satisfaction ➔	Patient Perceptions of Nursing Care	0.15	0.05	0.007	Significant; Accepted	62.50% Partial
1.b	Nursing Perceptions of Mgmt. Support	➔ Nursing Work Satisfaction ➔ Patient Perceptions of Nursing Care ➔	Patient Perceptions of Physician Care	0.11	0.04	0.012	Significant; Accepted	64.71% Partial
2.a	Nursing Perceptions of Mgmt. Support	➔ Nursing Work Satisfaction ➔	Physician Perceptions of Nursing Quality	0.37	0.19	0.05	Significant; Accepted	80.43% Full
2.b	Nursing Perceptions of Mgmt. Support	➔ Nursing Work Satisfaction ➔ Physician Perceptions of Nursing Quality ➔ Patient Perceptions of Physician Care ➔	Patient Perceptions of Nursing Care	0.01	0.06	0.84	Not Significant; Rejected	Not Applicable
3	Physician Perceptions of Admin. Support	➔ Physician Perceptions of Nursing Quality ➔	Patient Perceptions of Physician Care	0.08	0.03	0.003	Significant; Accepted	88.89% Full
Alt. 3	Nursing Perceptions of Mgmt. Support	➔ Nursing Work Satisfaction ➔ Physician Perceptions of Nursing Quality ➔	Patient Perceptions of Physician Care	0.06	0.05	0.28	Not Significant; Rejected	Not Applicable

*Note: The variance accounted for (VAF) value of greater than 80% is full mediation, between 20% and 80% is partial mediation (Hair et. al., 2014). VAF = indirect effect / total effect *100; Total effect = indirect effect + direct effect.

4.11. Summary

This chapter has presented data analysis methods and study results. In addition, it has explored the impact of nursing work satisfaction and nursing perceptions of management support on physician perceptions and patient perceptions. A proposed final model is also identified in this chapter. In the next chapter, the implications of the findings for nursing management support and nursing satisfaction will be discussed. This study will also examine the differences and consistency between its major findings from this study and the findings of several related studies on satisfaction in the healthcare literature. Discussion of the resulting limitations to this study will also be presented.

CHAPTER 5: DISCUSSION

5.1. Introduction

This chapter presents a summary of this study and important conclusions drawn from the research questions that guided this study and the data presented in Chapter 4. This chapter details how this study's findings compare with those in the literature and with its conceptual framework. Included in this chapter are also practical implications for professional practice as well as recommendations for further research. This chapter contains the following sections:

- Introduction
- Summary of the study - Overview of the problem, statement of study objective, and research questions
- Discussion
- Implications for actions and recommendations for further research
- Strengths and limitations of the study
- Conclusions

5.2. Summary of the Study - Overview of the Problem, Statement of Study Objective, and Research Questions

The increasing need to improve health care quality has driven government agencies such as the Centers for Medicare and Medicaid Services (CMS), health care providers, and payors alike to better define and measure the quality of health care. It has long been thought that there is a strong link between patient satisfaction and patient outcomes, and patient satisfaction has been identified as a key factor associated with health care quality (Cleary and McNeil, 1988). However, very little research has shown strong empirical evidence

establishing this linkage for the component of patient satisfaction. This study sought to examine and define the relationships among patient satisfaction, nursing satisfaction, physician satisfaction, and management support; it hoped to deepen understanding by proposing a framework for how the three key stakeholders impact one anothers' satisfaction as well as how specific management support activities influence nursing work engagement and perceptions of nursing quality among physicians. The objectives of this quantitative study was to examine the relationships among patient satisfaction, nurse satisfaction, physician satisfaction, and perceived management support.

As this study sought to suggest relationships among variables and due to its quantitative nature, specific mediation hypotheses were used to guide the researcher in finding answers.

- Hypothesis 1.a: The association between nursing staff's positive perceptions of management support and higher patient perceptions of nursing care is mediated by higher nursing satisfaction.
- Hypothesis 1.b: The association between nursing staff's positive perceptions of management support and higher patient perceptions of physician care is mediated by two mediators: higher nursing work satisfaction and higher patient perceptions of nursing care.
- Hypothesis 2.a: The association between nursing staff's positive perceptions of management support and higher physician perceptions of nursing quality is mediated by higher nursing satisfaction.
- Hypothesis 2.b: The association between nursing staff's positive perceptions of management support and higher patient perceptions of nursing care is mediated by

three mediators: higher nursing work satisfaction, higher physician perceptions of nursing quality, and higher patient perceptions of physician care.

- Hypothesis 3: The association between physicians' positive perceptions of administration support and higher patient perceptions of physician care is mediated by higher physician perceptions of nursing quality.
- Alternate Pathway to Hypothesis 3: The association between nursing staff's positive perceptions of management support and higher patient perceptions of physician care is mediated by two mediators: higher nursing work satisfaction and higher physician perceptions of nursing quality.

5.3. Discussion

Three hypotheses were formulated for this study. The researcher studied the following outcome measures: a) patient perceptions of nursing care; b) patient perceptions of physician care; and c) physician perceptions of nursing quality. Patient perceptions of nursing care were analyzed in association with nursing perceptions of management support, nursing satisfaction, physician perceptions of nursing quality, and patient perceptions of physician care. Patient perceptions of physician care were analyzed in association with nursing perceptions of management support, nursing satisfaction, patient perceptions of nursing care, physician perceptions of administration support, and physician perceptions of nursing quality. Physician perceptions of nursing quality were analyzed in association with nursing perceptions of management support, nursing satisfaction, and physician perceptions of administration support.

5.3.1. Discussion of major findings

This discussion section reviews the major findings for each hypothesis followed by a discussion of its relationship with previous research, and an analysis of the implications of these findings for future studies. Several suggestions are made concerning the relevance of these findings for practice in the U.S.

5.3.1.1. Nursing Perceptions of Management Support and Nursing Satisfaction - Hypothesis 1.a and 1.b

Hypothesis 1.a argued that the association between nursing staff's positive perceptions of management support and higher patient perceptions of nursing care is mediated by higher nursing satisfaction. Hypothesis 1.b argued that the association between nursing staff's positive perceptions of management support and higher patient perceptions of physician care is mediated by two mediators: higher nursing work satisfaction and higher patient perceptions of nursing care.

5.3.1.1.1. Major findings and relationship with previous research

It was found that nursing satisfaction partially mediated the relationship between nursing perceptions of management support and patient perceptions of nursing care; 62.50% of the effect of nursing perceptions of management support on patient perceptions of nursing care is explained via nursing satisfaction. This finding is consistent with this study's hypothesis; it is also consistent with previous literature that identifies management support such as facilitation of teamwork, communication, relationship building, and leadership can engage nursing staff in their work, which leads to nursing work satisfaction and patient satisfaction (DiMeglio et al., 2005; Lewis-Hunstiger, 2006; Meterko, Mohr, & Young, 2004; Sellgren, Ekvall, & Tomson, 2008). This study's results are also consistent with the research

findings from Johnson and Russell (2015) which identified that the care provider's interaction with the patient has the strongest impact on patient satisfaction which is based on perceived service quality.

The researcher also found that both nursing satisfaction and patient perceptions of nursing care partially mediated the relationship between nursing perceptions of management support and patient perceptions of physician care; 64.71% of the effect of nursing perceptions of management support on patient perceptions of physician care is explained via nursing satisfaction and patient perceptions of nursing care. This finding is a surprise for the researcher as no previous studies have looked at the relationship nor its impact. A closely related theory with which this study can connect is trust transfer: positive interaction with patients and active management of outcome quality greatly affect patients' trust and the trust transfer (Lien, Wu, Chen, & Wang, 2014). Positive nursing perceptions of management support can positively affect nursing satisfaction and patient perceptions of nursing care, which in turn positively affect patient perceptions of physician care.

5.3.1.2. Nursing Perceptions of Management Support and Nursing Satisfaction - Hypothesis 2.a and 2.b

Hypothesis 2.a argued that the association between nursing staff's positive perceptions of management support and higher physician perceptions of nursing quality is mediated by higher nursing satisfaction. Hypothesis 2.b argued that the association between nursing staff's positive perceptions of management support and higher patient perceptions of nursing care is mediated by three mediators: higher nursing work satisfaction, higher physician perceptions of nursing quality, and higher patient perceptions of physician care.

Major findings and relationship with previous research

In the present study, nursing satisfaction fully mediated the relationship between nursing perceptions of management support and physician perceptions of nursing quality; 80.43% of the effect of nursing perceptions of management support on physician perceptions of nursing quality is explained via nursing satisfaction. This finding is consistent with this investigation's hypothesis. However, no previous studies have examined this specific relationship. From a broader work environment perspective, previous research indicated that physicians desire an environment that demonstrates commitment to quality, fosters a high level of communication and collaboration, provides competent support services, and maintains strong financial relationships (Baird & Kirby, 2014). A healthcare environment that positively engages physicians can potentially cultivate a base of committed medical staff (Condra & Pearson, 2008) and positive physician work performance (Al-Amin & Makarem, 2016). As staff quality is commonly regarded as a key factor contributing to a desired work environment that demonstrates commitment of quality and provides competent support services, we consider positive physician perceptions of nursing quality a reflection of a desired work environment. This study's finding reveals that positive nursing perceptions of management support lead to higher levels of nursing satisfaction and higher levels of nursing satisfaction positively affect physician perceptions of nursing quality, which may in turn positively influence physician's views of the work environment.

5.3.1.3. Physician Perceptions of Nursing Quality and Physician Perceptions of Administration Support - Hypothesis 3

Hypothesis 3 posited that the association between physicians' positive perceptions of administration support and higher patient perceptions of physician care is mediated by higher physician perceptions of nursing quality. An alternate Pathway to Hypothesis 3 argued that

the association between nursing staff's positive perceptions of management support and higher patient perceptions of physician care is mediated by two mediators: higher nursing work satisfaction and higher physician perceptions of nursing quality.

Major findings and relationship with previous research

It was found that physician perceptions of nursing quality fully mediated the relationship between physician perceptions of administration support and patient perceptions of physician care; 88.89% of the effect of physician perceptions of administration support on patient perceptions of physician care is explained via physician perceptions of nursing quality. This finding is consistent with our hypothesis. However, no previous studies have looked at the specific relationship nor its impact. While the researcher found a large number of previous studies focusing on physicians' job satisfaction, a relatively small number of academic studies exist which identify the connection between management / administration support and physician satisfaction (Bell, Bringman, Bush, & Phillips, 2006; Bouwkamp-Memmer, Whiston, & Hartung, 2013; Cooper, Rout, & Faragher, 1989; Etchegaray et al., 2010; Hann, Reeves, & Sibbald, 2011; Jönsson, 2012; Konrad et al., 1999; Lavanchy, 2004; Lichtenstein, 1984; Mcintyre & Mcintyre, 2010; Mohr & Burgess, 2011).

As previously mentioned, staff quality is commonly regarded as a key factor contributing to a desired work environment, and so is ample administration support that fosters a high level of communication and collaboration. A desired healthcare environment shapes physicians' attitudes and perceptions about healthcare organizations, which may influence their cooperative behavior toward hospital performance and success and its effects on organizational performance indicators (Al-Amin & Makarem, 2016; Dukerich & Golden, 2002) including patient perceptions of physician care. This study's finding brings a complex

healing relationship to light: the influence of positive physician perceptions of administration support on patient perceptions of physician care is indirect, more specifically, positive physician perceptions of administration support influences patient perceptions of physician care through a third mediating variable, positive physician perceptions of nursing quality.

5.4. Implications for Action & Recommendations for Further Research

5.4.1. Nursing satisfaction

Nursing satisfaction is an important mediator in this study's model. Combining the major findings of this study's hypothesis testing, the researcher concludes that both patient perceptions of nursing care and physician perceptions of nursing quality can be strengthened and enhanced by raising the level of nursing satisfaction. Higher levels of nursing satisfaction lead to higher levels of patient perceptions of nursing care and higher levels of physician perceptions of nursing quality, which in turn leads to higher levels of patient perceptions of physician care. This research demonstrates an indirect relationship between management / administration support and patient perceptions of care. Healthcare organizations may enhance the patient perceptions of care by addressing the factors that influence nursing staff's job satisfaction. As direct managers of nursing staff have direct influence on nursing staff's work satisfaction, this study suggests that nursing staff's job satisfaction can be improved by practicing effective communication and recognition.

5.4.1.1. Implications for nursing management: effective communication and recognition

5.4.1.1.1. My direct manager communicates effectively.

Effective communication skills are possibly the most important attribute a manager can possess, especially for nurse managers who are often under time pressure in a busy unit. Nurse managers / front-line managers are expected to serve as a liaison between hospital /

organization executives and nursing staff, relaying information and leading nursing staff while ensuring patients' needs are met through managing the work systems and all patient care policies and procedures of their units. Nurse managers are also responsible for developing the full potential of their nursing staff through performance management, a process that helps managers to develop staff to attain unit, departmental, and organizational goals. Nurse managers' effective communication enable them in carrying out a successful performance management process: setting clear expectations, providing positive and corrective feedback, and delivering an effective performance appraisal. In addition, nurse managers are charged with mediating any conflicts that arise among nursing staff members, and between their nursing staff and other disciplines, as well as assisting patients with complaints or concerns about their medical care.

Effective communication, a complex two-way process, is considered successful when all parties involved arrive at the same understanding of the subject(s) being communicated. While common practices such as creating clear lines of communication, an open-door policy, avoiding defensive behaviors, holding regular team meetings and briefings, displaying empathy and understanding, and maintaining positive communication, can enhance communication and collaboration between nurse managers and nursing staff, utilizing focus groups to solicit ideas on how to improve communication between the direct manager and the nursing staff is an viable idea to further tailor for effective communication in a given unit or organization. Ideas from focus groups enable nurse managers to adequately articulate their messages and gain understanding of the nursing staff they are communicating with in order to perceive how their nursing staff best learn and receive information. Holding focus groups

also empowers nursing staff members to be part of finding solutions to issues that affect them directly, as well as clarifying their expectations towards their nurse managers.

5.4.1.1.2. My direct manager recognizes my ideas or suggestions for improvement.

Nursing staff members have a strong sense of responsibility towards their patients, their fellow team members, and their nurse managers. To enhance their work satisfaction, nurse managers can further their strong sense of responsibility by creating a sense of ownership through recognizing their ideas or suggestions for improvement. Common practices of empowerment and participatory management are conducted through an established organizational structure to allow nursing staff to provide input into major decisions while managers and administrators maintain the ultimate decision-making authority. Conversely, creating a sense of ownership is a process of staff engagement where nursing staff members are expected to make and own decisions, in addition to providing input. Such an engagement process requires nurse managers to:

1. Be transparent in their communication with their staff about the mission, vision, financial matters, goals, strategic plans, and performance data of the organization as well as of the unit and the department to keep the staff informed and to enhance their understanding of how they fit into the big picture.
2. Actively seek out nursing staff to participate in any decision that involves them such as supplies and equipment, process changes, quality improvement activities…etc.
3. Create and maintain consistent, formal, structured systems to receive nursing staff insights and feedback.

4. Tell the truth: Professionally provide feedback and explanation to staff's suggestions that are unlikely to be implemented.
5. Practice active listening. In addition to a common open-door policy, conduct regular and frequent rounds to visit with and talk with the nursing staff.
6. Establish an effective working relationship with each nursing staff member.

5.4.2. Recommendations for further research

This research considers nurse staff satisfaction, the most important mediator in this research's model, to be a vital determinant of patient perceptions of care. This study's findings encourage nurse managers to practice effective communication and recognition to improve nursing staff job satisfaction, which in return will likely result in higher patient perceptions of care and physician perceptions of nursing quality. A more holistic approach can be adopted by conducting research into relationships among nursing perceptions of management support, nursing staff satisfaction, patient perceptions of care, patient trust, and increased utilization of services. Most patients do not possess knowledge to evaluate the technical competence of the healthcare organizations and its staff; they often judge the hospital and its staff by interpersonal aspects of care that are provided and the manner in which medical care is delivered to them. It is possible that their perceptions of clinician care may influence their confidence / trust in the healthcare organization, which may impact their repurchasing behaviors.

5.5. Strengths and Limitations of the Study

5.5.1. Strengths

- Representative sample: This study's assumption is that participating hospitals may vary significantly in size, by region, accreditation, Magnet status, trauma level,

special types of services and type of facility. This variability of participating hospital characteristics strengthens the generalizability of the study outcomes.

- The significant size and scope of the database: Press Ganey Associates, Inc. states that it "offers the largest comparative patient feedback database containing real-time data from more hospitals than any other HCAHPS vendor in the nation" (Press Ganey Associates Inc., 2014).
- Low cost: the study utilizes an existing database of 86 hospital surveys for 2012.
- Managerial relevance: the study provides a greater understanding of pathways to improvement. As demand for improving the satisfaction of key stakeholders continues to increase while keeping a healthy bottom line, this study may provide insights into proactive management of key stakeholders' experiences.
- Importance: the topic focuses on increasingly important areas of healthcare.

5.5.2. Limitations

- Limited to 86 hospitals; there are more than 5,000 hospitals in the U.S.
- Challenge in ruling out confounding factors.
- Testing effects.
- Choice of predictor variables defined by availability in the dataset.
- Patients with limited English ability may not respond fully to the survey.
- Generalizability: The study is using the hospital survey responses from those hospitals that utilized all three Press Ganey survey instruments; therefore, results may not apply to hospitals using different vendors for different stakeholders.

- No time dependent covariates are an assumption. This may be a study limitation in that the independent variables remain static over the study duration but the facility's status may change such as changes in ownership and leadership.
- Administering an identical survey to the same types of patients / stakeholders using different modes (mail, phone, IVR) may result in differences in how individuals respond to the survey due to the method of data collection (Elliott et al., 2009).

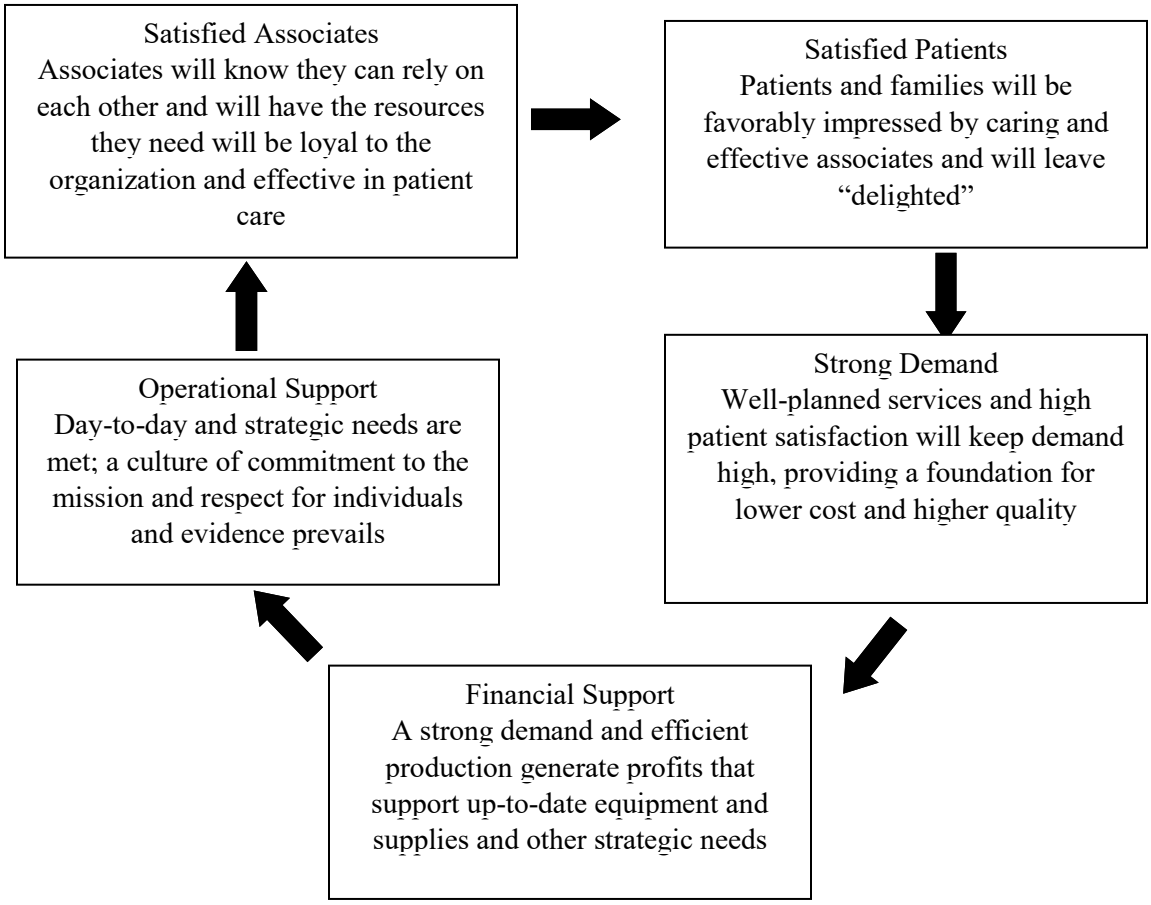
5.6. Conclusions

Compassion is one of the most crucial elements of care delivery, which makes healthcare unique in the service industry. With rapid adoption of technologies in healthcare, compassion and basic human values are becoming more important than ever. Although algorithms outperform humans in making diagnoses based on quantifiable data and software, robots, and smart machines are gradually adopted in healthcare settings, robots /automation will not be able to provide empathy, compassion, and a myriad of other human values with proper levels of sophistication for a long time to come. As previously mentioned, measurements of patient perceptions of care are based on interpersonal aspects of care that are provided and the manner in which medical care is delivered to the patients. Patients as healthcare service recipients do not possess technical knowledge for making judgments on the technical components of care.

This study demonstrates the importance of the humanistic approach in the care delivery. While it is reasonable to conclude that management / administration support for clinicians may be increasingly needed in today's complex healthcare systems, additional research is essential to fully understand its ripple effects. Management support is not only important in improving nursing satisfaction, but also contributing to creating and sustaining healthy work

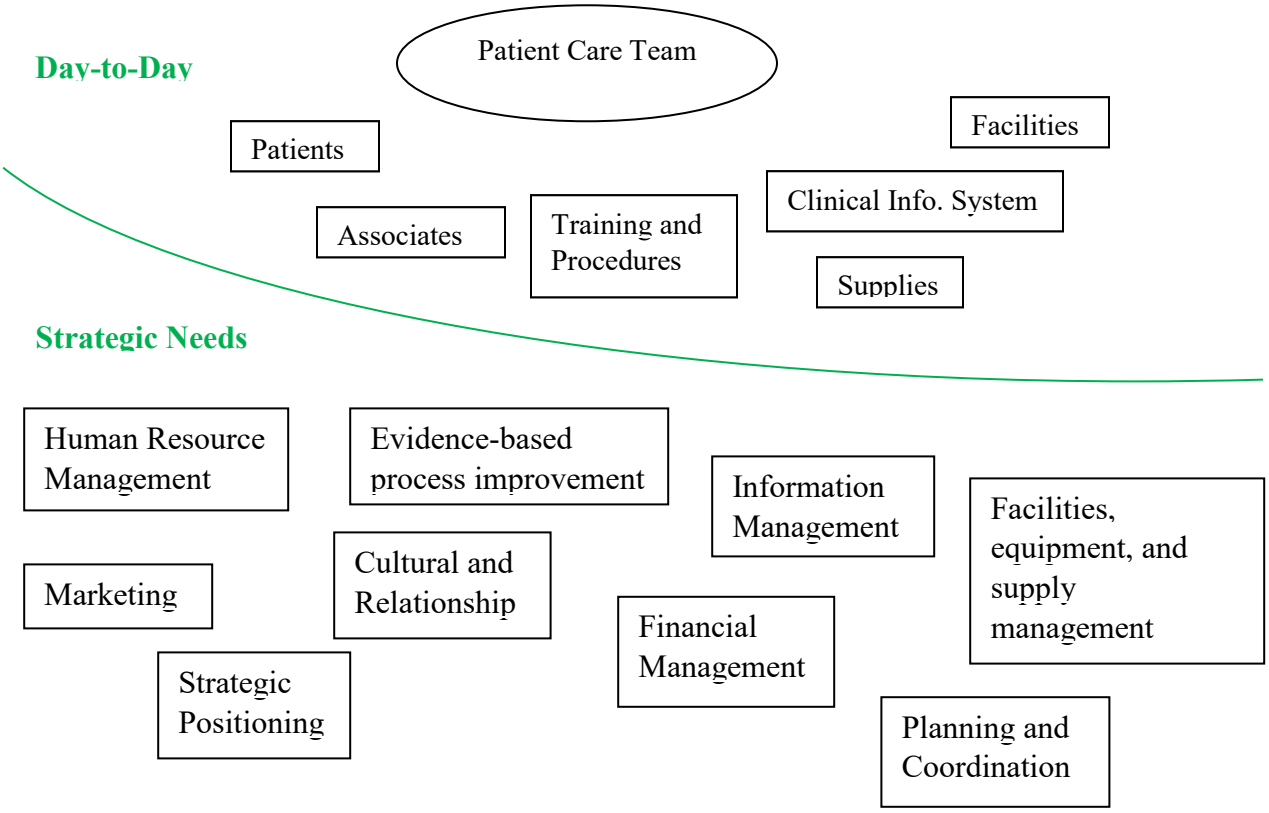
environments through effective communication and recognition. Within the boundaries of this study's results, the researcher learns that the ripple effects of management support manifest in patient perceptions of care, at the front lines or the point of care. It may also hold promise in manifesting patients' repurchasing behaviors and developing lasting healing relationships with patients.

Appendix 1.1. The Service Excellence Chain in Healthcare



Appendix 1.1. The Service Excellence Chain in Healthcare, illustrating the relationship between satisfaction and management support. Adapted from Chapter Four: Managing the Healthcare Organization, by Griffith, J. R., & White, K.R.2006. 6th edition. The Well-Managed Healthcare Organization, p. 113. Copyright 2007 by Griffith, J. R. & White, K.R.

Appendix 1.2. Management Support to the Patient Care Team



Appendix 1.2. The management support to the patient care team's day-to-day needs and strategic needs. Adapted from Chapter Four: Managing the Healthcare Organization, by Griffith, J. R., & White, K.R.2006. 6th Edition. The Well-Managed Healthcare Organization, p. 110. Copyright 2007 by Griffith, J. R.,& White, K.R.

Appendix 3.1. Press Ganey Inpatient Survey Instrument (Pages 1 of 2)

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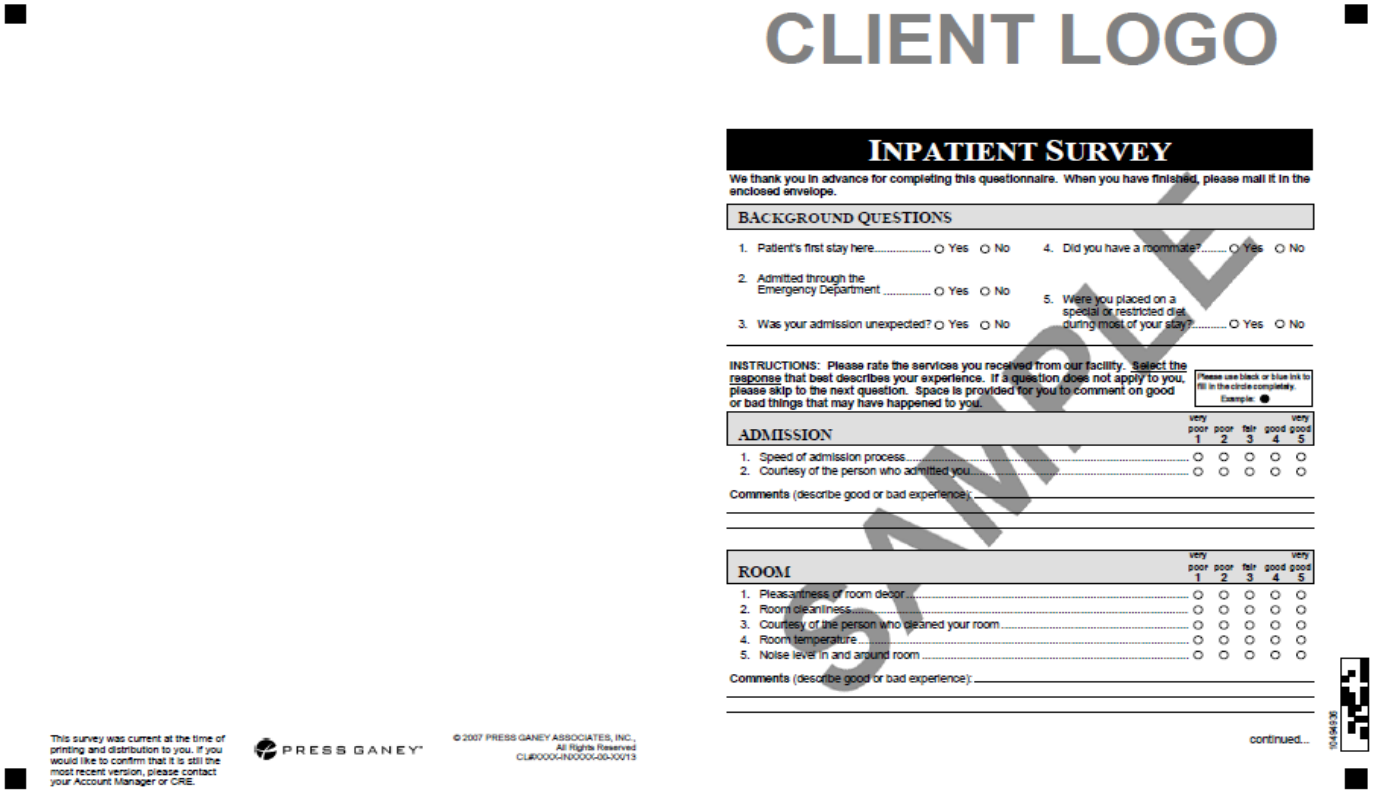


CLIENT LOGO

INPATIENT SURVEY

We thank you in advance for completing this questionnaire. When you have finished, please mail it in the enclosed envelope.

BACKGROUND QUESTIONS

1. Patient's first stay here..... ○ Yes ○ No
2. Admitted through the Emergency Department ..... ○ Yes ○ No
3. Was your admission unexpected? ○ Yes ○ No
4. Did you have a roommate?..... ○ Yes ○ No
5. Were you placed on a special or restricted diet during most of your stay?..... ○ Yes ○ No

INSTRUCTIONS: Please rate the services you received from our facility. Select the response that best describes your experience. If a question does not apply to you, please skip to the next question. Space is provided for you to comment on good or bad things that may have happened to you.

Please use black or blue ink to fill in the circle completely. Example: ●

ADMISSION	very poor 1	poor 2	fair 3	good 4	very good 5
1. Speed of admission process	○	○	○	○	○
2. Courtesy of the person who admitted you	○	○	○	○	○

Comments (describe good or bad experience):

ROOM	very poor 1	poor 2	fair 3	good 4	very good 5
1. Pleasantness of room decor	○	○	○	○	○
2. Room cleanliness	○	○	○	○	○
3. Courtesy of the person who cleaned your room	○	○	○	○	○
4. Room temperature	○	○	○	○	○
5. Noise level in and around room	○	○	○	○	○

Comments (describe good or bad experience):

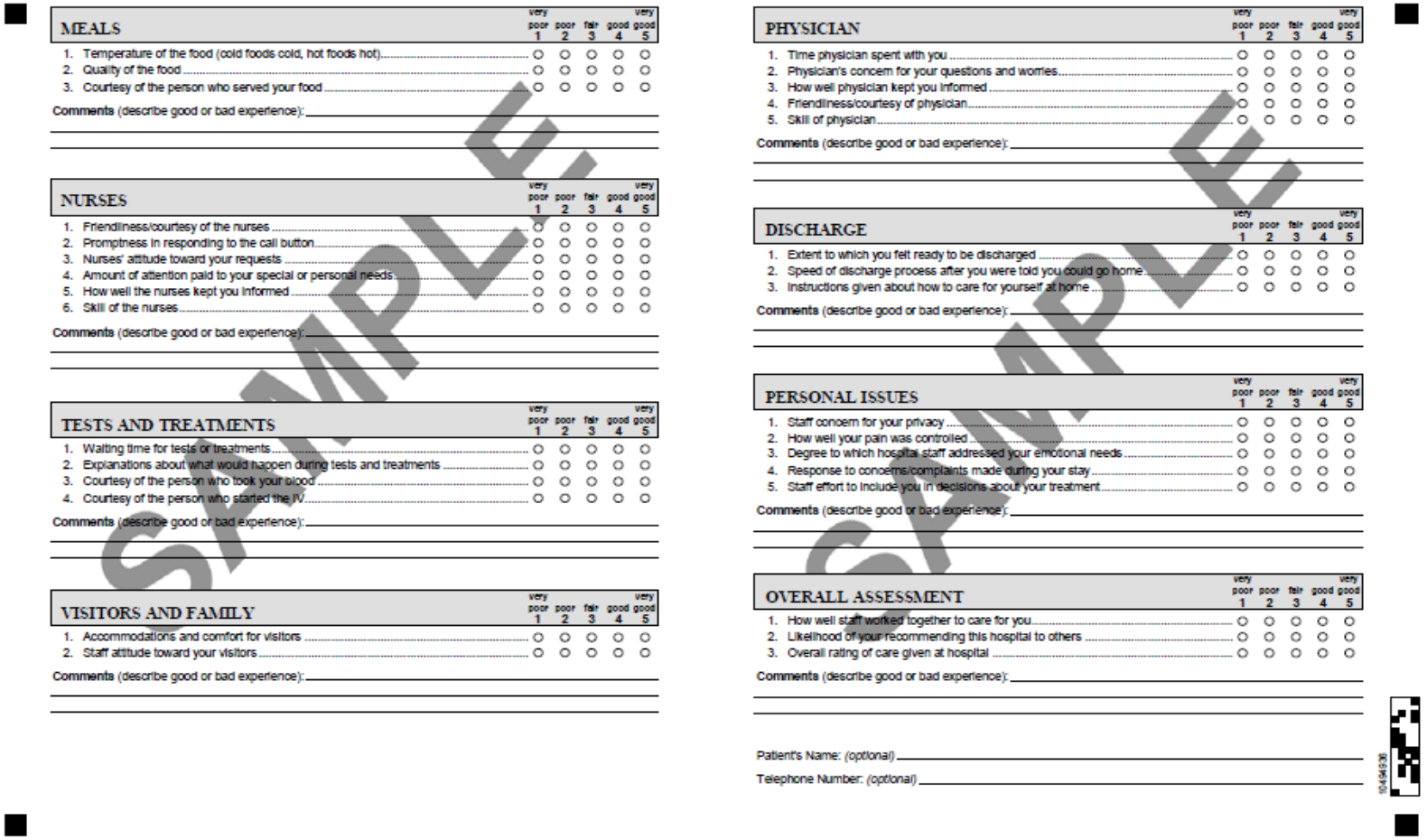
SAMPLE

This survey was current at the time of printing and distribution to you. If you would like to confirm that it is still the most recent version, please contact your Account Manager or CRE.

PRESS GANEY

continued...

Appendix 3.1. Press Ganey Inpatient Survey Instrument (Pages 2 of 2)



MEALS

	very poor 1	poor 2	fair 3	good 4	very good 5
1. Temperature of the food (cold foods cold, hot foods hot)	○	○	○	○	○
2. Quality of the food	○	○	○	○	○
3. Courtesy of the person who served your food	○	○	○	○	○

Comments (describe good or bad experience):

NURSES

	very poor 1	poor 2	fair 3	good 4	very good 5
1. Friendliness/courtesy of the nurses	○	○	○	○	○
2. Promptness in responding to the call button	○	○	○	○	○
3. Nurses' attitude toward your requests	○	○	○	○	○
4. Amount of attention paid to your special or personal needs	○	○	○	○	○
5. How well the nurses kept you informed	○	○	○	○	○
6. Skill of the nurses	○	○	○	○	○

Comments (describe good or bad experience):

TESTS AND TREATMENTS

	very poor 1	poor 2	fair 3	good 4	very good 5
1. Waiting time for tests or treatments	○	○	○	○	○
2. Explanations about what would happen during tests and treatments	○	○	○	○	○
3. Courtesy of the person who took your blood	○	○	○	○	○
4. Courtesy of the person who started the IV	○	○	○	○	○

Comments (describe good or bad experience):

VISITORS AND FAMILY

	very poor 1	poor 2	fair 3	good 4	very good 5
1. Accommodations and comfort for visitors	○	○	○	○	○
2. Staff attitude toward your visitors	○	○	○	○	○

Comments (describe good or bad experience):

PHYSICIAN

	very poor 1	poor 2	fair 3	good 4	very good 5
1. Time physician spent with you	○	○	○	○	○
2. Physician's concern for your questions and worries	○	○	○	○	○
3. How well physician kept you informed	○	○	○	○	○
4. Friendliness/courtesy of physician	○	○	○	○	○
5. Skill of physician	○	○	○	○	○

Comments (describe good or bad experience):

DISCHARGE

	very poor 1	poor 2	fair 3	good 4	very good 5
1. Extent to which you felt ready to be discharged	○	○	○	○	○
2. Speed of discharge process after you were told you could go home	○	○	○	○	○
3. Instructions given about how to care for yourself at home	○	○	○	○	○

Comments (describe good or bad experience):

PERSONAL ISSUES

	very poor 1	poor 2	fair 3	good 4	very good 5
1. Staff concern for your privacy	○	○	○	○	○
2. How well your pain was controlled	○	○	○	○	○
3. Degree to which hospital staff addressed your emotional needs	○	○	○	○	○
4. Response to concerns/complaints made during your stay	○	○	○	○	○
5. Staff effort to include you in decisions about your treatment	○	○	○	○	○

Comments (describe good or bad experience):

OVERALL ASSESSMENT

	very poor 1	poor 2	fair 3	good 4	very good 5
1. How well staff worked together to care for you	○	○	○	○	○
2. Likelihood of your recommending this hospital to others	○	○	○	○	○
3. Overall rating of care given at hospital	○	○	○	○	○

Comments (describe good or bad experience):

Patient's Name: *(optional)*

Telephone Number: *(optional)*

Appendix 3.2. Employee Partnership Survey (Pages 1 of 2)

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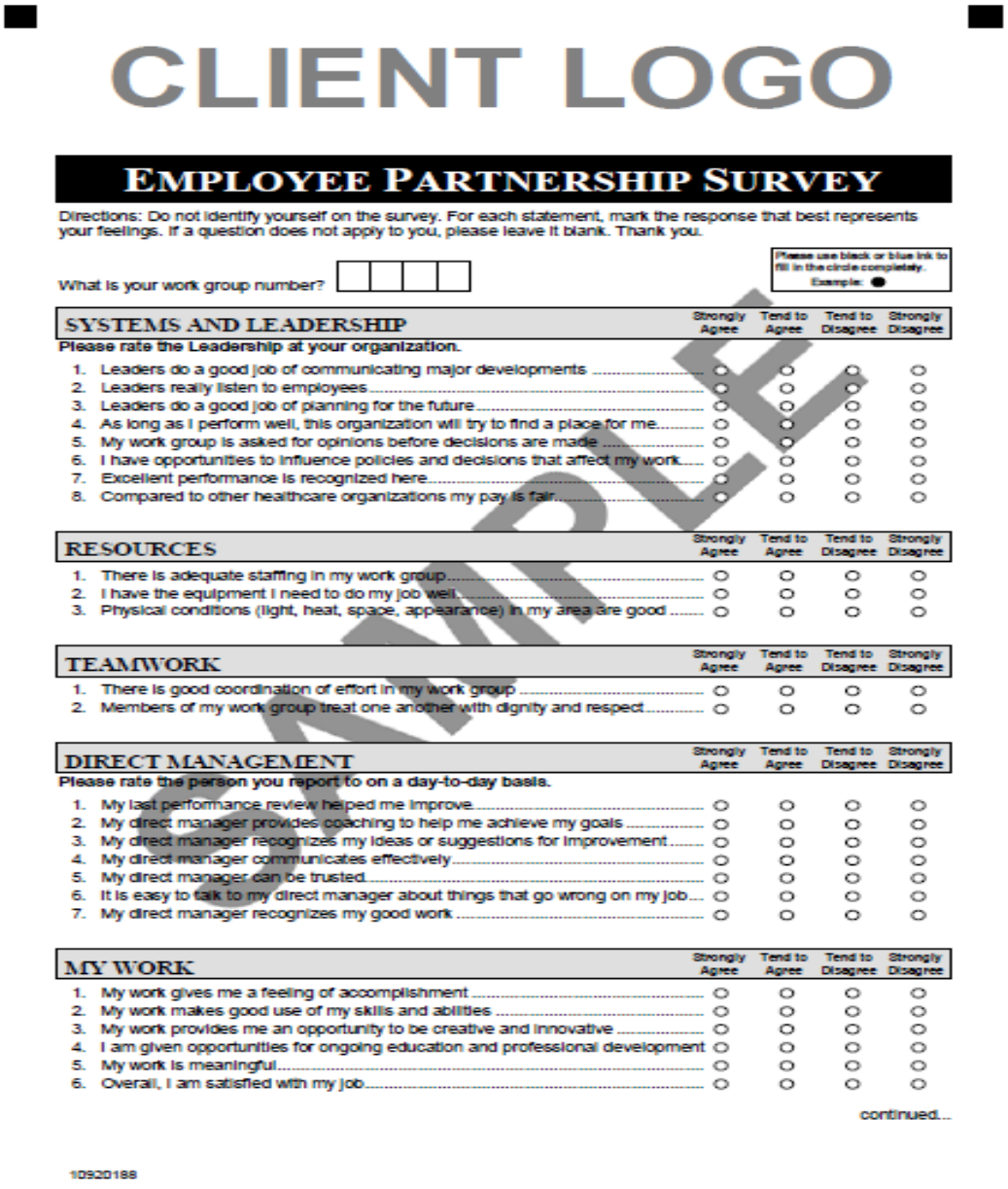

CLIENT LOGO

EMPLOYEE PARTNERSHIP SURVEY

Directions: Do not identify yourself on the survey. For each statement, mark the response that best represents your feelings. If a question does not apply to you, please leave it blank. Thank you.

Please use black or blue ink to fill in the circle completely. Example: ●

What is your work group number? ☐☐☐☐

SYSTEMS AND LEADERSHIP Please rate the Leadership at your organization.	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
1. Leaders do a good job of communicating major developments	○	○	○	○
2. Leaders really listen to employees	○	○	○	○
3. Leaders do a good job of planning for the future	○	○	○	○
4. As long as I perform well, this organization will try to find a place for me	○	○	○	○
5. My work group is asked for opinions before decisions are made	○	○	○	○
6. I have opportunities to influence policies and decisions that affect my work	○	○	○	○
7. Excellent performance is recognized here	○	○	○	○
8. Compared to other healthcare organizations my pay is fair	○	○	○	○

RESOURCES	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
1. There is adequate staffing in my work group	○	○	○	○
2. I have the equipment I need to do my job well	○	○	○	○
3. Physical conditions (light, heat, space, appearance) in my area are good	○	○	○	○

TEAMWORK	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
1. There is good coordination of effort in my work group	○	○	○	○
2. Members of my work group treat one another with dignity and respect	○	○	○	○

DIRECT MANAGEMENT Please rate the person you report to on a day-to-day basis.	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
1. My last performance review helped me improve	○	○	○	○
2. My direct manager provides coaching to help me achieve my goals	○	○	○	○
3. My direct manager recognizes my ideas or suggestions for improvement	○	○	○	○
4. My direct manager communicates effectively	○	○	○	○
5. My direct manager can be trusted	○	○	○	○
6. It is easy to talk to my direct manager about things that go wrong on my job	○	○	○	○
7. My direct manager recognizes my good work	○	○	○	○

MY WORK	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
1. My work gives me a feeling of accomplishment	○	○	○	○
2. My work makes good use of my skills and abilities	○	○	○	○
3. My work provides me an opportunity to be creative and innovative	○	○	○	○
4. I am given opportunities for ongoing education and professional development	○	○	○	○
5. My work is meaningful	○	○	○	○
6. Overall, I am satisfied with my job	○	○	○	○

continued...

10920188

SAMPLE

Appendix 3.2. Employee Partnership Survey (Pages 2 of 2)

OUR WORK	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
1. Employees in my work group regularly express their concerns and suggestions about our work	O	O	O	O
2. Our employees do everything they can to provide high quality service	O	O	O	O
3. Employees in my work group are fully attentive to the needs of others	O	O	O	O
4. Employees in my work group report a strong sense of connection to their work	O	O	O	O
5. Employees in my work group do everything they can to make this organization successful	O	O	O	O
6. Employees who work here are seldom distracted from their work	O	O	O	O

OUR ORGANIZATION	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
1. I plan to be working for this organization one year from now	O	O	O	O
2. I would recommend the healthcare services provided here to my friends and relatives	O	O	O	O
3. I would recommend this organization to a friend as a great place to work	O	O	O	O
4. I believe the quality of care here is excellent	O	O	O	O
5. I think this organization is highly regarded in the community	O	O	O	O
6. The values of the organization are evident in our everyday practices	O	O	O	O
7. Overall, I am satisfied with this organization	O	O	O	O

GENERAL QUESTIONS

To protect your confidentiality, responses to the following questions will be analyzed across the organization only and not by individual or work group.

1. I work: O Full time O Part time O Casual/PRN/As needed

2. My shift is: O Day O Evening O Night O Other

3. How long have you worked here?
   O Less than 2 years O 2 to 5 years O 6 to 10 years O More than 10 years

4. Do you supervise other employees (i.e., as a supervisor, manager, director, or Vice President)?
   O Yes O No

5. Which of the following best describes your job?
   O Registered Nurse O Office and clerical personnel O Service worker
   O Clinical Professional O All other administrative services O Other nursing services
   O Technical worker O Skilled maintenance

6. I was born in: O 1945 or earlier O 1946 to 1964 O 1965 to 1983 O 1984 or later

COMMENTS

Your comments will be transcribed word for word. Please do not share any information that would identify yourself.

What is the best thing about working for this organization?

How can this organization improve working conditions?

PRESS GANEY

This survey was current at the time of printing and distribution to you. If you would like to confirm that it is still the most recent version, please contact your Account Manager or CRE.

Appendix 3.3. Physician Partnership Survey (Pages 1 of 2)

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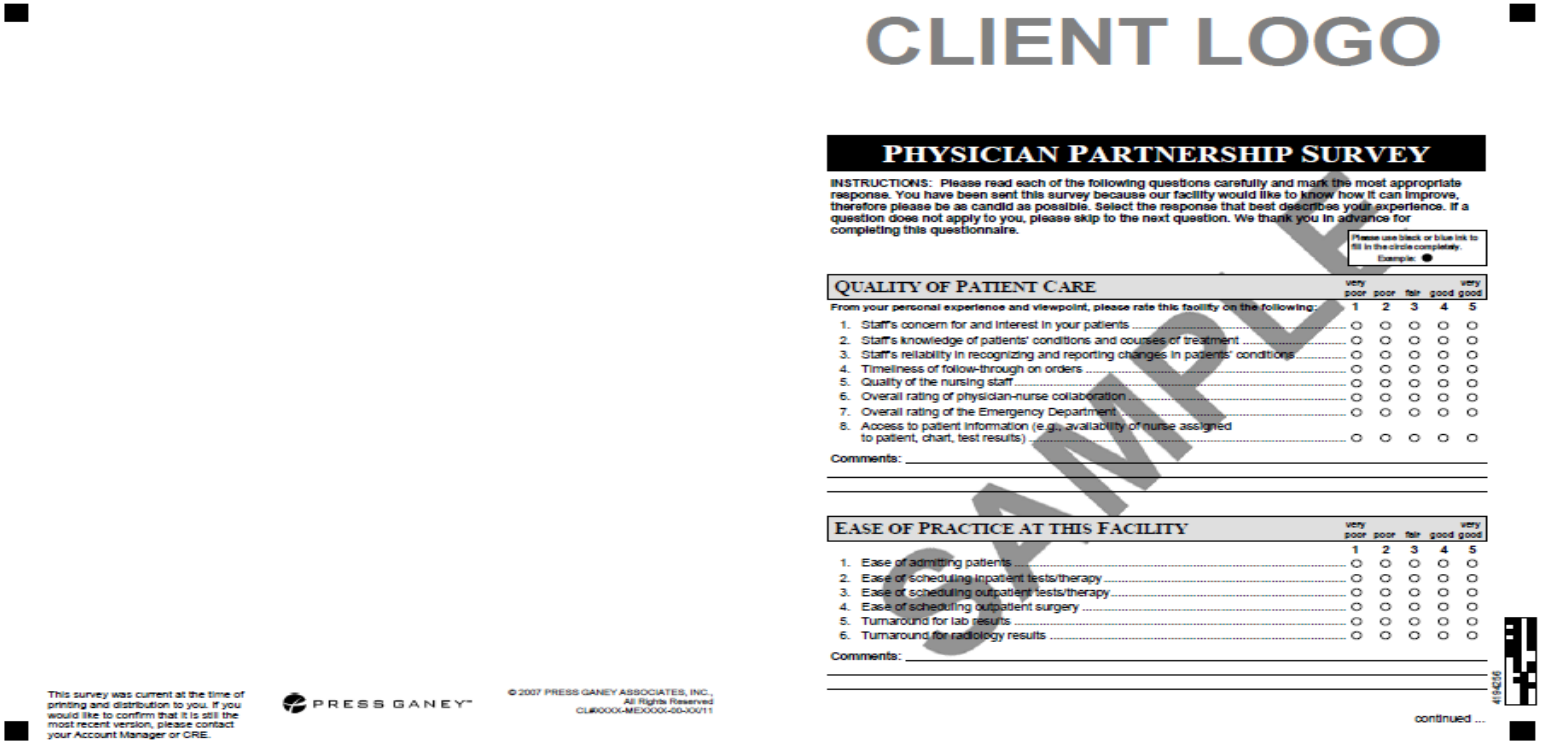


CLIENT LOGO

PHYSICIAN PARTNERSHIP SURVEY

INSTRUCTIONS: Please read each of the following questions carefully and mark the most appropriate response. You have been sent this survey because our facility would like to know how it can improve, therefore please be as candid as possible. Select the response that best describes your experience. If a question does not apply to you, please skip to the next question. We thank you in advance for completing this questionnaire.

Please use black or blue ink to fill in the circle completely. Example: ●

QUALITY OF PATIENT CARE

From your personal experience and viewpoint, please rate this facility on the following:

	very poor 1	poor 2	fair 3	good 4	very good 5
1. Staff's concern for and interest in your patients	○	○	○	○	○
2. Staff's knowledge of patients' conditions and courses of treatment	○	○	○	○	○
3. Staff's reliability in recognizing and reporting changes in patients' conditions	○	○	○	○	○
4. Timeliness of follow-through on orders	○	○	○	○	○
5. Quality of the nursing staff	○	○	○	○	○
6. Overall rating of physician-nurse collaboration	○	○	○	○	○
7. Overall rating of the Emergency Department	○	○	○	○	○
8. Access to patient information (e.g., availability of nurse assigned to patient, chart, test results)	○	○	○	○	○

Comments: _____

EASE OF PRACTICE AT THIS FACILITY

	very poor 1	poor 2	fair 3	good 4	very good 5
1. Ease of admitting patients	○	○	○	○	○
2. Ease of scheduling inpatient tests/therapy	○	○	○	○	○
3. Ease of scheduling outpatient tests/therapy	○	○	○	○	○
4. Ease of scheduling outpatient surgery	○	○	○	○	○
5. Turnaround for lab results	○	○	○	○	○
6. Turnaround for radiology results	○	○	○	○	○

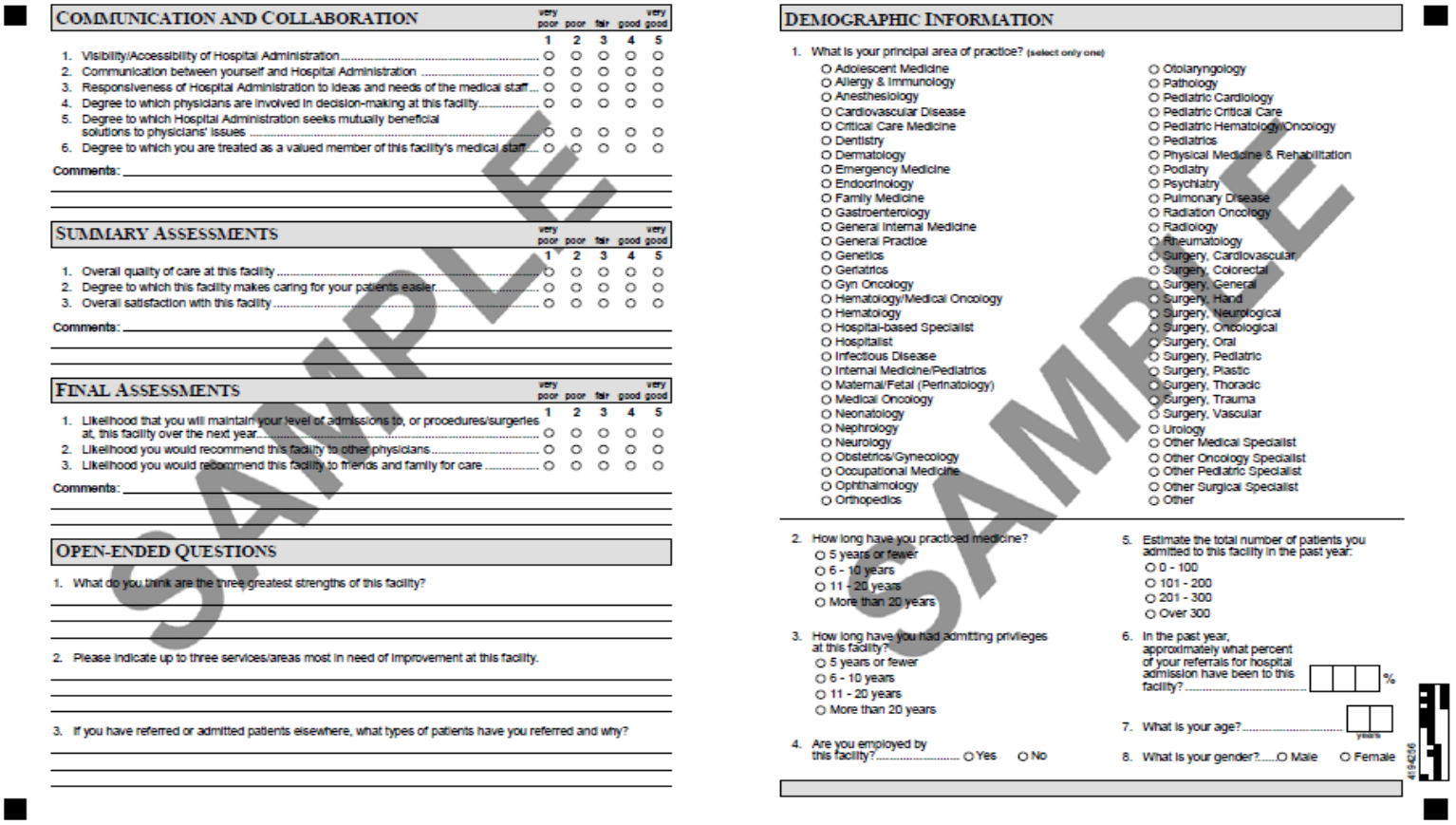
Comments: _____

continued ...

This survey was current at the time of printing and distribution to you. If you would like to confirm that it is still the most recent version, please contact your Account Manager or CRE.

PRESS GANEY

Appendix 3.3. Physician Partnership Survey (Pages 2 of 2)



COMMUNICATION AND COLLABORATION

	very poor 1	poor 2	fair 3	good 4	very good 5
1. Visibility/Accessibility of Hospital Administration	○	○	○	○	○
2. Communication between yourself and Hospital Administration	○	○	○	○	○
3. Responsiveness of Hospital Administration to ideas and needs of the medical staff	○	○	○	○	○
4. Degree to which physicians are involved in decision-making at this facility	○	○	○	○	○
5. Degree to which Hospital Administration seeks mutually beneficial solutions to physicians' issues	○	○	○	○	○
6. Degree to which you are treated as a valued member of this facility's medical staff	○	○	○	○	○

Comments: _____

SUMMARY ASSESSMENTS

	very poor 1	poor 2	fair 3	good 4	very good 5
1. Overall quality of care at this facility	○	○	○	○	○
2. Degree to which this facility makes caring for your patients easier	○	○	○	○	○
3. Overall satisfaction with this facility	○	○	○	○	○

Comments: _____

FINAL ASSESSMENTS

	very poor 1	poor 2	fair 3	good 4	very good 5
1. Likelihood that you will maintain your level of admissions to, or procedures/surgeries at, this facility over the next year	○	○	○	○	○
2. Likelihood you would recommend this facility to other physicians	○	○	○	○	○
3. Likelihood you would recommend this facility to friends and family for care	○	○	○	○	○

Comments: _____

OPEN-ENDED QUESTIONS

1. What do you think are the three greatest strengths of this facility?

2. Please indicate up to three services/areas most in need of improvement at this facility.

3. If you have referred or admitted patients elsewhere, what types of patients have you referred and why?

DEMOGRAPHIC INFORMATION

1. What is your principal area of practice? (select only one)

- ○ Adolescent Medicine
- ○ Allergy & Immunology
- ○ Anesthesiology
- ○ Cardiovascular Disease
- ○ Critical Care Medicine
- ○ Dentistry
- ○ Dermatology
- ○ Emergency Medicine
- ○ Endocrinology
- ○ Family Medicine
- ○ Gastroenterology
- ○ General Internal Medicine
- ○ General Practice
- ○ Genetics
- ○ Geriatrics
- ○ Gyn Oncology
- ○ Hematology/Medical Oncology
- ○ Hematology
- ○ Hospital-based Specialist
- ○ Hospitalist
- ○ Infectious Disease
- ○ Internal Medicine/Pediatrics
- ○ Maternal/Fetal (Perinatology)
- ○ Medical Oncology
- ○ Neonatology
- ○ Nephrology
- ○ Neurology
- ○ Obstetrics/Gynecology
- ○ Occupational Medicine
- ○ Ophthalmology
- ○ Orthopedics
- ○ Otolaryngology
- ○ Pathology
- ○ Pediatric Cardiology
- ○ Pediatric Critical Care
- ○ Pediatric Hematology/Oncology
- ○ Pediatrics
- ○ Physical Medicine & Rehabilitation
- ○ Podiatry
- ○ Psychiatry
- ○ Pulmonary Disease
- ○ Radiation Oncology
- ○ Radiology
- ○ Rheumatology
- ○ Surgery, Cardiovascular
- ○ Surgery, Colorectal
- ○ Surgery, General
- ○ Surgery, Hand
- ○ Surgery, Neurological
- ○ Surgery, Oncological
- ○ Surgery, Oral
- ○ Surgery, Pediatric
- ○ Surgery, Plastic
- ○ Surgery, Thoracic
- ○ Surgery, Trauma
- ○ Surgery, Vascular
- ○ Urology
- ○ Other Medical Specialist
- ○ Other Oncology Specialist
- ○ Other Pediatric Specialist
- ○ Other Surgical Specialist
- ○ Other

2. How long have you practiced medicine?
   - ○ 5 years or fewer
   - ○ 6 - 10 years
   - ○ 11 - 20 years
   - ○ More than 20 years

3. How long have you had admitting privileges at this facility?
   - ○ 5 years or fewer
   - ○ 6 - 10 years
   - ○ 11 - 20 years
   - ○ More than 20 years

4. Are you employed by this facility? ○ Yes ○ No

5. Estimate the total number of patients you admitted to this facility in the past year:
   - ○ 0 - 100
   - ○ 101 - 200
   - ○ 201 - 300
   - ○ Over 300

6. In the past year, approximately what percent of your referrals for hospital admission have been to this facility? ☐☐☐ %

7. What is your age? ☐☐ years

8. What is your gender? ○ Male ○ Female

Appendix 3.4. Conversion of Scores from 1-5 to 0-100, Press Ganey Survey Instrument Score Calculations

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Outcomes driven. Performance strong.

Calculating Scores for Physician Partner Survey

Conversion of Scores from 1-5 to 0-100

When you look at your report, you will notice that the scores are reported on a 100-point scale, even though respondents rate your workplace on the survey using a 5-point scale that goes from "Very Poor" to "Very Good." We convert your physicians' ratings because most people find it easier to interpret scores on a 100-point scale.

Table 1. Conversion of Scores from 1-5 to 0-100

	Very Poor	Poor	Fair	Good	Very Good
Old Score	1	2	3	4	5
New Score	0	25	50	75	100

Calculation of Mean Scores

First scores are calculated for each physician. Each physician has a score for every question that was answered. These scores are converted as described above. *For each physician*, section scores (e.g., a score for the Quality of Patient Care section) are then calculated as the mean of all the non-missing question scores within those sections (see Figure 1). Next, *for each physician*, a Satisfaction score is calculated as the mean of three Physician Satisfaction section scores, and an Engagement score is calculated as the mean of two Physician Engagement section scores (see Figure 1). Finally, *for each physician*, a Partnership score is calculated as the mean of all five section scores.

Second, scores are calculated for facilities and other groups. These scores are then aggregated to various levels (specialty, facility, etc.) *across physicians in those groups*. For example, the facility-level partnership score is the mean of the partnership scores for all physicians in that facility.

Figure 1. Relationships Among Items, Sections, and Overall Scores

Appendix 3.5. Conversion of Scores from 1-4 to 0-100, Press Ganey Survey Instrument Score Calculations

The Press Ganey scoring conversion reproduced from Press Ganey survey score calculations is under a signed data use agreement between the Johns Hopkins Bloomberg School of Public Health and Press Ganey Associates, Inc. The scoring conversion is copy righted by Press Ganey Associates, Inc., 2011.

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Calculating Scores for Employee Partner Survey

Conversion of Scores from 1-4 to 0-100

When you look at your report, you will notice that the scores are reported on a 100-point scale, even though respondents rate your workplace on the survey using a 4-point scale that goes from "Strongly Agree" to "Strongly Disagree." We convert your employees' ratings because most people find it easier to interpret scores on a 100-point scale.

Table 1. Conversion of Scores from 1-4 to 0-100

	Strongly Agree	Tend to Agree	Tend to Disagree	Strongly Disagree
Old Score	4	3	2	1
New Score	100	66.7	33.3	0

Calculation of Mean Scores

First scores are calculated for each employee. Each employee has a score for every question that was answered. These scores are converted as described above. *For each employee*, section scores (e.g., a score for the Resources section) are then calculated as the mean of all the non-missing question scores within those sections (see Figure 1). Next, *for each employee*, a Satisfaction score is calculated as the mean of four Employee Satisfaction section scores, and an Engagement score is calculated as the mean of three Employee Engagement section scores (see Figure 1). Finally, *for each employee*, a Partnership score is calculated as the mean of all seven section scores.

Second, scores are calculated for facilities and other groups. These scores are then aggregated to various levels (e.g., workgroup, facility) *across employees in those groups*. For example, the facility-level partnership score is the mean of the partnership scores for all employees in that facility.

Figure 1. Relationships Among Items, Sections, and Overall Scores

Appendix 3.6. Patient-level Characteristics from Press Ganey Associates, Inc. 2012 Inpatient Survey

Age
Gender
Admitted via Emergency Room
Diet: special or restricted diet during most of the patient's stay
Patients' self-descriptions regarding their health compared to others of their age
Status of sharing a hospital room during the stay

Appendix 3.7. Hospital-level Characteristics / Inpatient Demographic Profile, Press Ganey Associates, Inc. 2012 Survey

PG ID
American Hospital Association Region
Size of the hospital
Number of licensed Beds
Number of staffed Beds
Critical Access Hospital Status
Vacancy rate for nursing positions
Types of employees at facility represented by a union
Type of control/sponsorship
Facility's teaching status
Number of private rooms
Number of semi-private rooms
Affiliation with University Health System Consortium
Status of "Magnet Hospital" by the American Nurses Association
Total inpatient FTEs
Size of community
Number of physicians employed by the hospital as Hospitalists
Hospitalist employment models

Appendix 3.8. Physician-level Characteristics from Physician Partnership Survey, Press Ganey Associates, Inc. 2012 Survey

Age
Gender
Approximate percent of physician's referrals that are made to this facility
Principal area of practice
Estimated total number of patients physician admitted to this facility in the past year
Year(s) of admitting privileges at this facility
Employment status with the hospital

Appendix 3.9. Nursing-level Characteristics. Press Ganey Associates, Inc. 2012 Employee Partnership Survey

Employment status
Work shifts
Year(s) of employment at the hospital
Job description
Supervisory status

Appendix 4.1. Number of Variables with Missing Data in Hospital Demographic Dataset, Press Ganey Associates, Inc., 2012 Survey Data

Number of Variables with Missing Data	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	1.33	2	1.33
1	1	0.67	3	2
2	1	0.67	4	2.67
3	4	2.67	8	5.33
4	3	2	11	7.33
5	5	3.33	16	10.67
6	8	5.33	24	16
7	2	1.33	26	17.33
8	1	0.67	27	18
9	1	0.67	28	18.67
10	1	0.67	29	19.33
11	3	2	32	21.33
12	1	0.67	33	22
13	12	8	45	30
14	10	6.67	55	36.67
15	6	4	61	40.67
16	4	2.67	65	43.33
17	2	1.33	67	44.67
18	5	3.33	72	48
19	3	2	75	50
20	4	2.67	79	52.67
21	3	2	82	54.67
28	2	1.33	84	56
29	2	1.33	86	57.33
30	3	2	89	59.33
31	3	2	92	61.33
32	3	2	95	63.33
34	33	22	128	85.33
35	3	2	131	87.33
36	3	2	134	89.33
37	2	1.33	136	90.67
38	13	8.67	149	99.33
39	1	0.67	150	100

Appendix 4.2. Employee Partnership Demographic - Job Descriptions, Press Ganey Associates, Inc. 2012 Survey Data

Survey Demographic Question: Which of the following best describes your job?

Job Description	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Registered Nurse	27177	34.23	27177	34.23
Clinical Pro's	14266	17.97	41443	52.2
Fiscal/Admin Svc	4299	5.42	45742	57.62
Technicians	7832	9.87	53574	67.48
Office/Clerical	10987	13.84	64561	81.32
Maintenance	1302	1.64	65863	82.96
Service Worker	6042	7.61	71905	90.57
Physicians	10	0.01	71915	90.59
Nursing (LPN, CAN)	7397	9.32	79312	99.9
Non-medical Pro's	19	0.02	79331	99.93
Management	23	0.03	79354	99.96
Other Patient Care	35	0.04	79389	100

Appendix 4.3. Employee Demographic Dataset Number of Variables with Missing Data, Press Ganey Associates, Inc. 2012 Survey Data

Number of Variables with Missing Data	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	24135	69.81	24135	69.81
1	8054	23.29	32189	93.1
2	1627	4.71	33816	97.81
3	120	0.35	33936	98.15
4	42	0.12	33978	98.28
5	596	1.72	34574	100

Appendix 4.4. Number of Variables with Missing Data in Employee Partnership Survey Dataset, Press Ganey Associates, Inc. 2012 Survey Data

Number of Variables with Missing Data	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	78689	85.39	78689	85.39
1	8028	8.71	86717	94.1
2	2022	2.19	88739	96.29
3	843	0.91	89582	97.21
4	547	0.59	90129	97.8
5	374	0.41	90503	98.21
6	326	0.35	90829	98.56
7	348	0.38	91177	98.94
8	221	0.24	91398	99.18
9	136	0.15	91534	99.32
10	109	0.12	91643	99.44
11	77	0.08	91720	99.53
12	64	0.07	91784	99.6
13	88	0.1	91872	99.69
14	35	0.04	91907	99.73
15	32	0.03	91939	99.76
16	22	0.02	91961	99.79
17	21	0.02	91982	99.81
18	18	0.02	92000	99.83
19	16	0.02	92016	99.85
20	17	0.02	92033	99.87
21	3	0	92036	99.87
22	11	0.01	92047	99.88
23	21	0.02	92068	99.9
24	10	0.01	92078	99.91
25	7	0.01	92085	99.92
26	7	0.01	92092	99.93
27	8	0.01	92100	99.94
28	13	0.01	92113	99.95
29	10	0.01	92123	99.96
30	6	0.01	92129	99.97
31	5	0.01	92134	99.98
32	8	0.01	92142	99.98
33	5	0.01	92147	99.99
34	10	0.01	92157	100

Appendix 4.5. Physician Specialty, Press Ganey Associates, Inc. 2012 Survey Data

Specialty	Frequency	Percent
Allergy & Immunology	3	0.03
Anesthesiology	698	6.79
Cardiovascular Disease	411	4
Critical Care Medicine	26	0.25
Dentistry	67	0.65
Dermatology	14	0.14
Emergency Medicine	831	8.09
Endocrinology	22	0.21
Family Medicine	1070	10.41
Gastroenterology	199	1.94
General Internal Medicine	1303	12.68
Hematology	3	0.03
Infectious Disease	41	0.4
Medical Oncology	39	0.38
Nephrology	97	0.94
Neurology	145	1.41
Obstetrics/Gynecology	701	6.82
Orthopedics	392	3.81
Otolaryngology	101	0.98
Pathology	193	1.88
Pediatrics	576	5.6
Physical Medicine & Rehabilitation	35	0.34
Podiatry	93	0.9
Psychiatry	146	1.42
Pulmonary Disease	110	1.07
Radiation Oncology	15	0.15
Radiology	653	6.35
Rheumatology	10	0.1
Surgery, Cardiovascular	16	0.16
Surgery, General	480	4.67
Surgery, Neurological	69	0.67
Surgery, Oral	16	0.16
Surgery, Plastic	75	0.73
Surgery, Vascular	29	0.28
Urology	123	1.2
Other Medical Specialist	497	4.84

Specialty	Frequency	Percent
Other Surgical Specialist	447	4.35
Other	47	0.46
Ophthalmology	92	0.9
Neonatology	65	0.63
Maternal/Fetal Med	15	0.15
Surgery, Thoracic	28	0.27
Gyn Oncology	4	0.04
Surgery, Colorectal	3	0.03
Hospitalist	97	0.94
Occupational Medicine	4	0.04
Other Pediatric Specialist	12	0.12
Hematology/Medical Oncology	103	1
Hospital-based Specialist	4	0.04
Surgery, Hand	3	0.03
Surgery, Pediatric	3	0.03
Physician Asst	6	0.06
Other Mid-Level Provider	3	0.03
Surgery, Oncological	3	0.03
Surgery, Transplant	17	0.17
Undersea and Hyperbaric Medicine	6	0.06
Orthopedic Surgery, Spine	8	0.08
Pediatric Hospital Medicine	6	0.06
Surgery, Cardio Thoracic	3	0.03

Appendix 4.6. Physician Demographic Dataset Number of Variables with Missing Data, Press Ganey Associates, Inc. 2012 Survey Data

Number of Variables with Missing Data	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1915	18.75	1915	18.75
1	1063	10.41	2978	29.16
2	2530	24.77	5508	53.94
3	1548	15.16	7056	69.1
4	1748	17.12	8804	86.21
5	1357	13.29	10161	99.5
6	51	0.5	10212	100

Appendix 4.7. Number of Variables with Missing Data, Physician Survey Responses, Press Ganey Associates, Inc. 2012 Survey Data

Number of Variables with Missing Data	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	7285	60.4	7285	60.4
1	1625	13.47	8910	73.87
2	758	6.28	9668	80.15
3	518	4.29	10186	84.45
4	351	2.91	10537	87.36
5	337	2.79	10874	90.15
6	255	2.11	11129	92.26
7	180	1.49	11309	93.76
8	120	0.99	11429	94.75
9	96	0.8	11525	95.55
10	78	0.65	11603	96.19
11	62	0.51	11665	96.71
12	55	0.46	11720	97.16
13	54	0.45	11774	97.61
14	38	0.32	11812	97.93
15	42	0.35	11854	98.28
16	20	0.17	11874	98.44
17	30	0.25	11904	98.69
18	28	0.23	11932	98.92
19	19	0.16	11951	99.08
20	8	0.07	11959	99.15
21	53	0.44	12012	99.59
22	18	0.15	12030	99.73
23	12	0.1	12042	99.83
24	19	0.16	12061	99.99
25	1	0.01	12062	100

Appendix 4.8. Number of Variables with Missing data, Patient Survey Responses, Press Ganey Associates, Inc. 2012 Survey Data

Number of Variables with Missing Data	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	7032	4.11	7032	4.11
1	4312	2.52	11344	6.63
2	3479	2.03	14823	8.66
3	2078	1.21	16901	9.88
4	3165	1.85	20066	11.73
5	50632	29.6	70698	41.33
6	15311	8.95	86009	50.27
7	7318	4.28	93327	54.55
8	5853	3.42	99180	57.97
9	3864	2.26	103044	60.23
10	2820	1.65	105864	61.88
11	2109	1.23	107973	63.11
12	1556	0.91	109529	64.02
13	1159	0.68	110688	64.7
14	900	0.53	111588	65.23
15	657	0.38	112245	65.61
16	473	0.28	112718	65.89
17	386	0.23	113104	66.11
18	329	0.19	113433	66.3
19	326	0.19	113759	66.5
20	227	0.13	113986	66.63
21	194	0.11	114180	66.74
22	182	0.11	114362	66.85
23	122	0.07	114484	66.92
24	125	0.07	114609	66.99
25	128	0.07	114737	67.07
26	93	0.05	114830	67.12
27	206	0.12	115036	67.24
28	233	0.14	115269	67.38
29	109	0.06	115378	67.44
30	164	0.1	115542	67.54
31	191	0.11	115733	67.65
32	73	0.04	115806	67.69
33	117	0.07	115923	67.76
34	64	0.04	115987	67.8

Number of Variables with Missing Data	Frequency	Percent	Cumulative Frequency	Cumulative Percent
35	86	0.05	116073	67.85
36	290	0.17	116363	68.02
37	98	0.06	116461	68.07
38	75	0.04	116536	68.12
39	41	0.02	116577	68.14
40	290	0.17	116867	68.31
41	86	0.05	116953	68.36
42	41	0.02	116994	68.39
43	51	0.03	117045	68.42
44	50	0.03	117095	68.45
45	23	0.01	117118	68.46
46	55	0.03	117173	68.49
47	67	0.04	117240	68.53
48	34	0.02	117274	68.55
49	7	0	117281	68.55
51	53794	31.44	171075	100
52	3	0	171078	100.00

Appendix 4.9. Patient Age, Press Ganey Associates, Inc. 2012 Survey Data

N	Mean	Std Dev	Median	Minimum	Maximum
117,116	60.2	19.0	63.0	18	90

Appendix 4.10. Patient Demographics, Press Ganey Associates, Inc. 2012 Survey Data

Valid/ Missing	Patient Demographic Characteristics	Frequency	Percent	Cumulative Frequency	Cumulative Percent
	Gender				
Valid	Male	45,677	39.00	45,677	39.00
	Female	71,381	60.95	117,058	99.95
Missing		58	0.05	117,116	100.00
	Admitted via Emergency Room				
Valid	Yes	13,387	11.43	13,387	11.43
	No	11,594	9.90	24,981	21.33
Missing		92,135	78.67	117,116	100.00
	DIET. Were you placed on a special or restricted diet during most of your stay? (Y/N)				
Valid	Yes	8,682	7.41	8,682	7.41
	No	10,093	8.62	18,775	16.03
Missing		98,341	83.97	117,116	100.00
	HEALTH. Compared to others your age, would you typically describe your health as:				
Valid	Very Poor	407	0.35	407	0.35
	Poor	1,481	1.26	1,888	1.61
	Fair	4,404	3.76	6,292	5.37
	Good	8,414	7.18	14,706	12.56
	Very Good	4,545	3.88	19,251	16.44
Missing		97,865	83.56	117,116	100.00
	Did you have a roommate? (Y/N)				
Valid	Yes	3,977	3.40	3,977	3.40
	No	12,043	10.28	16,020	13.68
Missing		101,096	86.32	117,116	100.00

Appendix 4.11. Frequencies and Percent Distributions of Nursing Staff's Job Characteristics in PG Participating Hospitals, Press Ganey Associates, Inc. 2012 Survey Data

Valid/ Missing	Demographic Characteristics	Frequency	Percent	Cumulative Frequency	Cumulative Valid Percent
	I was born in:				
Valid	1945 or earlier	393	1.44	393	1.54
	1946 to 1964	8953	32.83	9346	36.59
	1965 to 1983	11941	43.78	21287	83.34
	1984 or later	4256	15.61	25543	100.00
Missing	No response	1729	6.34	27272	
	I work:				
Valid	full-time	20509	75.20	20509	77.25
	part-time	3921	14.77	24430	92.02
	Casual/PRN/as-needed	2119	7.98	26549	100.00
Missing	No response	723		27272	
	Which of the following best describes your job?				
Valid	Registered Nurse	21,468	78.72	21468	78.75
	Other nursing services	5,793	21.24	27261	100.00
Missing	No response	11	0.04	27272	
	How long have you worked here?				
Valid	< 2 years	5,955	21.84	5,955	22.47
	2 to 5 years	7,366	27.01	13,321	50.26
	6 to 10 years	5,130	18.81	18,451	69.62
	more than 10 years	8,051	29.52	26,502	100.00
Missing	No response	770	2.82	27,272	
	My Shift is:				
Valid	Day	15,803	57.95	15,803	63.30
	Evening	1,282	4.70	17,085	68.44
	Night	6,454	23.67	23,539	94.29
	Other	1,426	5.23	24,965	100.00
Missing	No response	2,307	8.46	27,272	
	Do you supervise other employees?				
Valid	Yes	3,320	12.17	3,320	13.12
	No	21,980	80.60	25,300	100.00
Missing	No response	1,972	7.23	27,272	

Appendix 4.12. Frequencies and Percent Distributions for 7,104 Physicians in PG Participating Hospitals, Press Ganey Associates, Inc. 2012 Survey Data

Demographic Characteristics		Frequency	Percent	Cumulative Frequency	Cumulative Valid Percent
Estimate the total number of patients you admitted to this facility in the past year:					
Valid	0-100	2,274	32.01	2,274	63.2
	101-200	553	7.78	2,827	78.57
	201-300	285	4.01	3,112	86.49
	over 300	486	6.84	3,598	100.00
Missing		3,506	49.35	7,104	
How long have you had admitting privileges at this facility?					
Valid	5 years or fewer	1,349	18.99	1,349	37.59
	6 - 10 years	646	9.09	1,995	55.59
	11 - 20 years	840	11.82	2,835	78.99
	more than 20 years	754	10.61	3,589	100.00
Missing		3,515	49.48	7,104	
Are you employed by this facility?					
Valid	yes	1,164	16.39	1,164	30.78
	no	2,618	36.85	3,782	100.00
Missing		3,322	46.76	7,104	
Estimate the total number of patients you provided care to at this clinic in the past year.					
Valid	0-500	920	12.95	920	19.56
	501-1000	804	11.32	1,724	36.66
	1001-1500	1,283	18.06	3,007	63.94
	1501-2000	1,696	23.87	4,703	100.00
Missing		2,401	33.80	7,104	

Appendix 4.13. Physician Age and Approximate Number of Referrals to This Facility in the Past Year, Press Ganey Associates, Inc. 2012 Survey Data

	Missing	Mean	Std. Dev.	Median	Minimum	Maximum
Approximate Number of Referrals to this Facility in the Past Year	3590	75	34.24	95	0	100
Physician Age	751	48	11.24	47	25	87

Appendix 4.14. Top 25 Principal Areas of Practice, Press Ganey Associates, Inc. 2012 Survey Data

Valid/Missing	Specialty	Frequency	Percent	Cumulative Frequency	Cumulative Valid Percent
Valid	Allergy & Immunology	3	0.04	3	0.05
	Anesthesiology	563	7.93	566	8.63
	Cardiovascular Disease	292	4.11	858	13.09
	Critical Care Medicine	26	0.37	884	13.48
	Dentistry	45	0.63	929	14.17
	Dermatology	14	0.20	943	14.38
	Emergency Medicine	648	9.12	1,591	24.27
	Endocrinology	22	0.31	1,613	24.6
	Family Medicine	715	10.06	2,328	35.51
	Gastroenterology	137	1.93	2,465	37.6
	General Internal Medicine	997	14.03	3,462	52.81
	Infectious Disease	38	0.53	3,500	53.39
	Medical Oncology	29	0.41	3,529	53.83
	Nephrology	69	0.97	3,598	54.88
	Neurology	118	1.66	3,716	56.68
	Orthopedics	300	4.22	4,016	61.26
	Otolaryngology	81	1.14	4,097	62.49
	Pathology	156	2.20	4,253	64.87
	Pediatrics	504	7.09	4,757	72.56
	Physical Medicine & Rehabilitation	35	0.49	4,792	73.09
	Podiatry	56	0.79	4,848	73.95

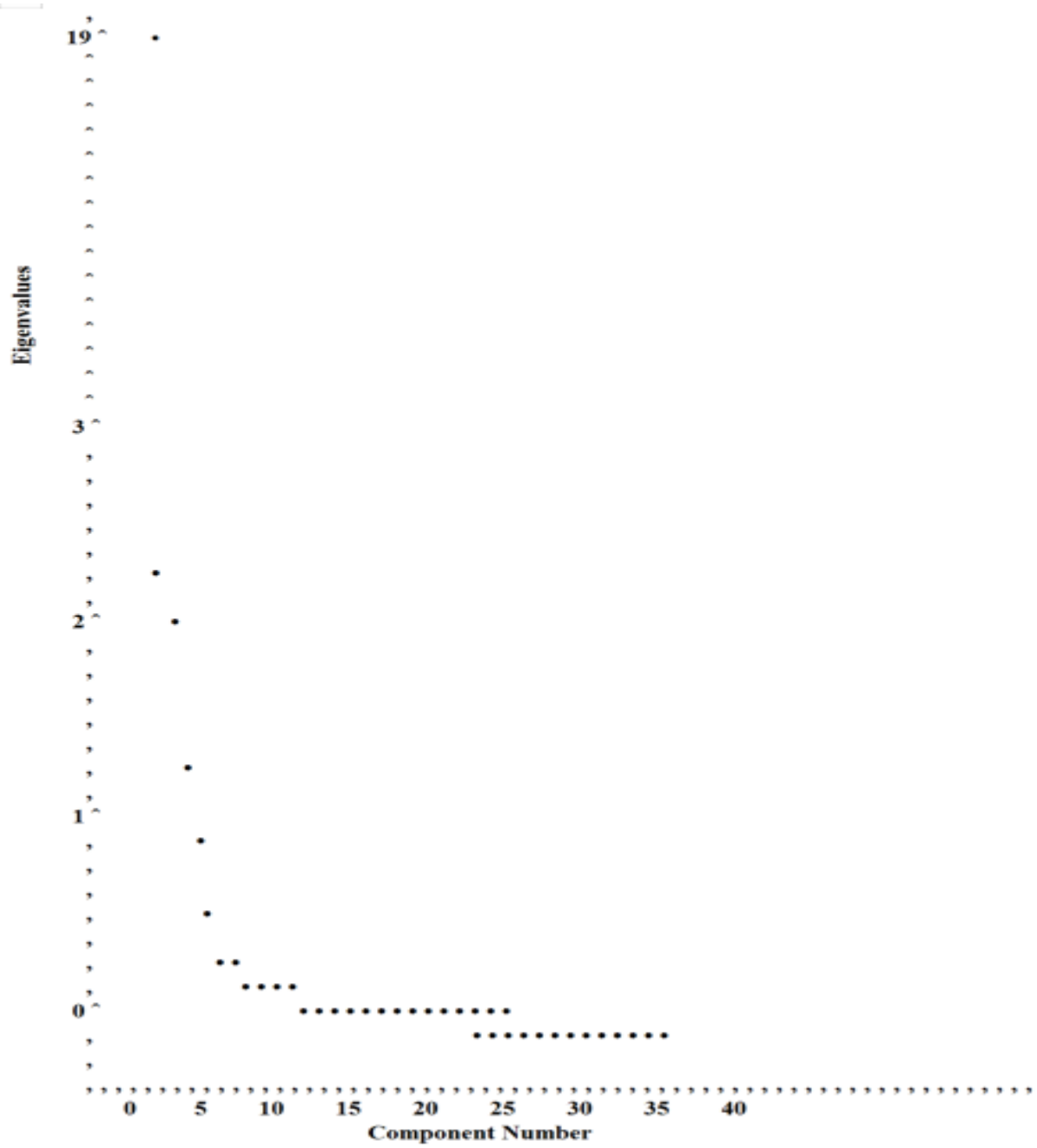
Valid/Missing	Specialty	Frequency	Percent	Cumulative Frequency	Cumulative Valid Percent
	Pulmonary Disease	95	1.34	4,943	75.4
	Radiation Oncology	15	0.21	4,958	75.63
	Radiology	489	6.88	5,447	83.08
	Rheumatology	10	0.14	5,457	83.24
	.	.	.	.	.
	.	.	.	.	.
	.	.	.	.	100
Missing		548	7.71	7,104	

Appendix 4.15. Eigenvalues from Factor Analysis of Employee Partnership Survey Items of Null Model (39 survey items; 4 factors suggested)

	Eigenvalue	Difference	Proportion	Cumulative
1	19.011668	16.8215075	0.7473	0.7473
2	2.1901604	0.1650669	0.0861	0.8334
3	2.0250935	0.7191623	0.0796	0.913
4	1.3059312	0.3711973	0.0513	0.9644
5	0.9347339	0.4706012	0.0367	1.0011
6	0.4641327	0.1715255	0.0182	1.0194
7	0.2926072	0.0759384	0.0115	1.0309
8	0.2166688	0.0317304	0.0085	1.0394
9	0.1849384	0.040649	0.0073	1.0466
10	0.1442894	0.0395961	0.0057	1.0523
11	0.1046933	0.0130422	0.0041	1.0564
12	0.0916511	0.043474	0.0036	1.06
13	0.0481771	0.0119449	0.0019	1.0619
14	0.0362322	0.011189	0.0014	1.0633
15	0.0250432	0.0192568	0.001	1.0643
16	0.0057864	0.0156287	0.0002	1.0646
17	-0.0098423	0.0080005	-0.0004	1.0642
18	-0.0178428	0.0103878	-0.0007	1.0635
19	-0.0282306	0.0044647	-0.0011	1.0624
20	-0.0326953	0.0042956	-0.0013	1.0611
21	-0.0369909	0.0059783	-0.0015	1.0596
22	-0.0429692	0.0049737	-0.0017	1.0579
23	-0.0479429	0.0034731	-0.0019	1.056
24	-0.051416	0.0087111	-0.002	1.054
25	-0.0601272	0.001937	-0.0024	1.0517
26	-0.0620642	0.0013608	-0.0024	1.0492
27	-0.0634249	0.0051631	-0.0025	1.0467
28	-0.068588	0.0049647	-0.0027	1.044
29	-0.0735527	0.0057136	-0.0029	1.0411
30	-0.0792663	0.0028877	-0.0031	1.038
31	-0.082154	0.0056721	-0.0032	1.0348
32	-0.0878261	0.0066539	-0.0035	1.0313
33	-0.0944801	0.0016239	-0.0037	1.0276
34	-0.0961039	0.0042733	-0.0038	1.0239
35	-0.1003773	0.004716	-0.0039	1.0199
36	-0.1050933	0.0030678	-0.0041	1.0158
37	-0.1081611	0.0207396	-0.0043	1.0115
38	-0.1289007	0.0354373	-0.0051	1.0065
39	-0.164338		-0.0065	1

Appendix 4.16. A Scree Plot from Factor Analysis of Employee Partnership Survey Items of Null Model (39 survey items) (with more than one elbows; 3 factors suggested- Eigenvalues greater than 1)

Note: See Appendix 4.15 for components with negative Eigenvalues.

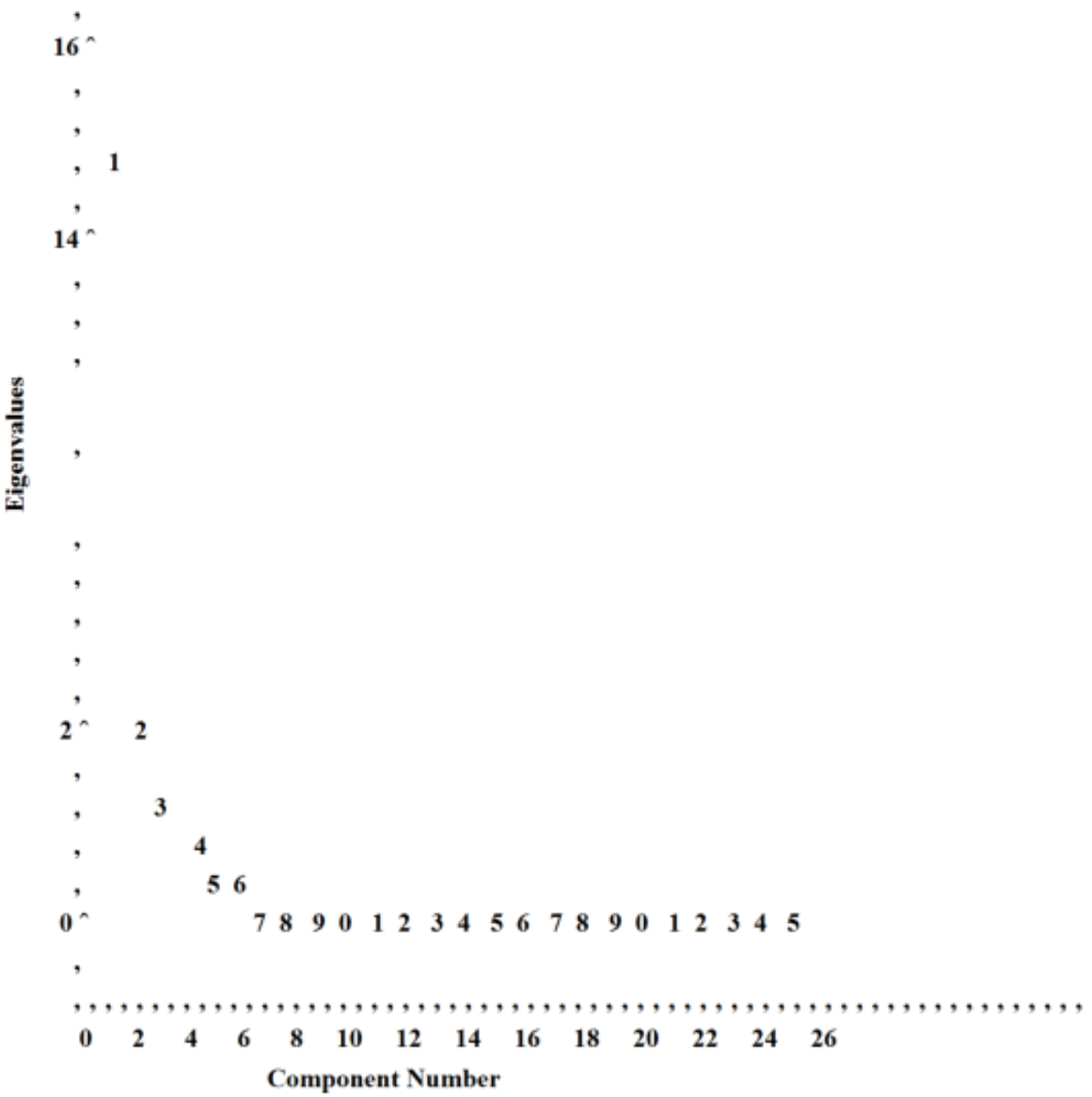


Appendix 4.17. Eigenvalues from Factor Analysis of Physician Partnership Survey Items for Null Model (25 survey items; 3 factors suggested – Eigenvalues greater than 1)

	Eigenvalue	Difference	Proportion	Cumulative
1	14.7798119	12.8899102	0.7534	0.7534
2	1.8899017	0.6401274	0.0963	0.8497
3	1.2497742	0.5296675	0.0637	0.9134
4	0.7201067	0.2457941	0.0367	0.9501
5	0.4743126	0.2458067	0.0242	0.9743
6	0.2285059	0.0646376	0.0116	0.9859
7	0.1638683	0.0151586	0.0084	0.9943
8	0.1487097	0.038849	0.0076	1.0019
9	0.1098607	0.00702	0.0056	1.0075
10	0.1028406	0.0213049	0.0052	1.0127
11	0.0815358	0.0269434	0.0042	1.0169
12	0.0545924	0.0270038	0.0028	1.0197
13	0.0275886	0.0201375	0.0014	1.0211
14	0.0074511	0.0176625	0.0004	1.0214
15	-0.0102114	0.0011739	-0.0005	1.0209
16	-0.0113853	0.0076316	-0.0006	1.0203
17	-0.0190168	0.0035793	-0.001	1.0194
18	-0.0225962	0.0115476	-0.0012	1.0182
19	-0.0341437	0.0037387	-0.0017	1.0165
20	-0.0378824	0.0069737	-0.0019	1.0146
21	-0.0448561	0.0016959	-0.0023	1.0123
22	-0.0465519	0.0069389	-0.0024	1.0099
23	-0.0534909	0.0146174	-0.0027	1.0072
24	-0.0681083	0.0043485	-0.0035	1.0037
25	-0.0724568		-0.0037	1

Appendix 4.18. A Scree Plot from Factor Analysis of Physician Partnership Survey Items of Null Model (25 survey items) (with more than one elbows; 3 factors suggested – Eigenvalues greater than 1)

Note: See Appendix 4.17 for components with negative Eigenvalues.

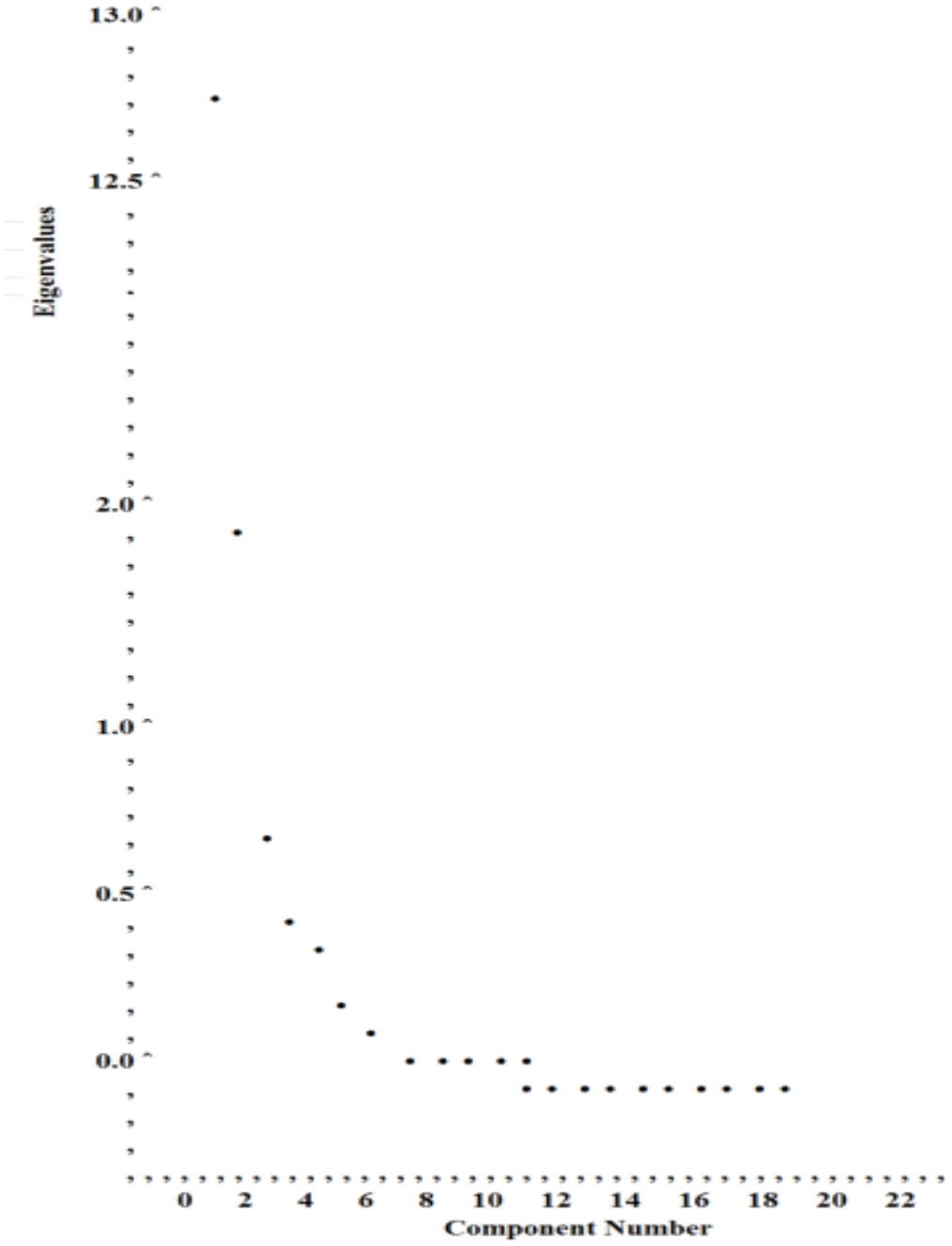


Appendix 4.19. Eigenvalues from Factor Analysis of Inpatient Survey Items for Null Model (22 survey items; 2 factors – Eigenvalues greater than 1)

	Eigenvalue	Difference	Proportion	Cumulative
1	12.7130987	10.8056297	0.8283	0.8283
2	1.907469	1.2717115	0.1243	0.9526
3	0.6357575	0.1955342	0.0414	0.994
4	0.4402233	0.1390974	0.0287	1.0227
5	0.3011259	0.1721607	0.0196	1.0423
6	0.1289651	0.0856566	0.0084	1.0507
7	0.0433085	0.0197027	0.0028	1.0536
8	0.0236058	0.035572	0.0015	1.0551
9	-0.0119662	0.0110391	-0.0008	1.0543
10	-0.0230053	0.0085467	-0.0015	1.0528
11	-0.031552	0.0026054	-0.0021	1.0508
12	-0.0341574	0.0110275	-0.0022	1.0485
13	-0.0451849	0.0075756	-0.0029	1.0456
14	-0.0527605	0.0082378	-0.0034	1.0422
15	-0.0609983	0.0019984	-0.004	1.0382
16	-0.0629967	0.007214	-0.0041	1.0341
17	-0.0702107	0.0064649	-0.0046	1.0295
18	-0.0766756	0.0004755	-0.005	1.0245
19	-0.0771511	0.0086585	-0.005	1.0195
20	-0.0858096	0.016431	-0.0056	1.0139
1	-0.1022406	0.0087293	-0.0067	1.0072
22	-0.1109699		-0.0072	1

Appendix 4.20. A Scree Plot from Factor Analysis of Inpatient Survey Items for Null Model (22 survey items) (two elbows; 3 factors suggested)

Note: See Appendix 4.19 for components with negative Eigenvalues.



Appendix 4.21. Null Model: Rotated Factor Pattern (Standardized Regression Coefficients), Three-factor Solution, Employee Partnership Survey Items

Note: Values greater than 0.55 are flagged by an "*"; cross-loading items and items with low loadings are presented in strikethrough texts.

Variable Label	Item	Factor 1	Factor 2	Factor 3
~~OW1~~	~~Employees in my work group regularly express their concerns and suggestions about our work.~~	~~0.23~~	~~0.25~~	~~0.49~~
OW2	Our employees do everything they can to provide high quality service.	0.25	0.14	0.75*
OW3	Employees in my work group are fully attentive to the needs of others.	0.21	0.20	0.82*
OW4	Employees in my work group report a strong sense of connection to their work.	0.28	0.20	0.80*
OW5	Employees in my work group do everything they can to make this organization successful.	0.25	0.18	0.81*
OO1	I plan to be working for this organization one year from now.	0.55*	0.18	0.24
OO2	I would recommend the healthcare services provided here to my friends and relatives.	0.73*	0.17	0.26
OO3	I believe the quality of care here is excellent.	0.72*	0.15	0.30
OO4	I think this organization is highly regarded in the community.	0.72*	0.15	0.20
OO5	I would recommend this organization to a friend as a great place to work.	0.78*	0.28	0.25
OO6	The values of this organization are evident in our everyday practices.	0.76*	0.21	0.30
SL1	Leaders do a good job of communicating major developments.	0.58*	0.45	0.16
SL2	Leaders really listen to employees.	0.61*	0.51	0.16
SL3	Leaders do a good job of planning for the future.	0.63*	0.43	0.17
SL4	As long as I perform well, this organization will try to find a place for me.	0.58*	0.40	0.17
~~SL5~~	~~My work group is asked for opinions before decisions are made.~~	~~0.55~~	~~0.50~~	~~0.19~~
SL6	I have opportunities to influence policies and decisions that affect my work.	0.56*	0.49	0.19
SL7	Excellent performance is recognized here.	0.57*	0.49	0.22
~~SL8~~	~~Compared to other healthcare organizations my pay is fair.~~	~~0.48~~	~~0.28~~	~~0.18~~
~~RE1~~	~~There is adequate staffing in my work group.~~	~~0.47~~	~~0.31~~	~~0.22~~
~~RE2~~	~~I have the equipment I need to do my job well.~~	~~0.51~~	~~0.29~~	~~0.23~~
~~RE3~~	~~Physical conditions (light, heat, space, appearance) in my area are good.~~	~~0.44~~	~~0.24~~	~~0.23~~
DM1	My last performance review helped me improve.	0.40	0.56*	0.27

Variable Label	Item	Factor 1	Factor 2	Factor 3
DM2	My direct manager provides coaching to help me achieve my goals.	0.31	0.78*	0.26
DM3	My direct manager recognizes my ideas or suggestions for improvement.	0.30	0.80*	0.28
DM4	My direct manager communicates effectively.	0.28	0.80*	0.26
DM5	My direct manager can be trusted.	0.27	0.80*	0.26
DM6	It is easy to talk to my direct manager about things that go wrong on my job.	0.25	0.80*	0.26
DM7	My direct manager recognizes my good work.	0.29	0.77*	0.27
TW1	There is good coordination of effort in my work group.	0.30	0.37	0.60*
TW2	Members of my work group treat one another with dignity and respect.	0.21	0.33	0.62*
~~MW1~~	~~My work gives me a feeling of accomplishment.~~	~~0.52~~	~~0.21~~	~~0.41~~
~~MW2~~	~~My work makes good use of my skills and abilities.~~	~~0.49~~	~~0.23~~	~~0.41~~
~~MW3~~	~~My work provides me an opportunity to be creative and innovative.~~	~~0.53~~	~~0.32~~	~~0.39~~
~~MW4~~	~~I am given opportunities for ongoing education and professional development.~~	~~0.50~~	~~0.34~~	~~0.28~~
~~MW5~~	~~My work is meaningful.~~	~~0.48~~	~~0.17~~	~~0.40~~
OW6	Employees who work here are seldom distracted from their work.	0.31	0.23	0.59*
MW6	Overall, I am satisfied with my job.	0.63*	0.31	0.37
OO7	Overall, I am satisfied with this organization.	0.80*	0.27	0.25

Appendix 4.22. Null Model: Rotated Factor Pattern, Three-factor Solution, Physician Partnership Survey Items

Note: Values greater than 0.55 are flagged by an ”*”; cross-loading items are presented in strikethrough texts.

Variable Label	Item	Factor 1	Factor 2	Factor 3
QPC1	Staff's concern for and interest in your patients	0.74*	0.27	0.27
QPC2	Staff's knowledge of patients' conditions and courses of treatment	0.77*	0.26	0.24
QPC3	Staff's reliability in recognizing and reporting changes in patients' conditions	0.78*	0.25	0.26
QPC4	Timeliness of follow-through on orders	0.72*	0.24	0.32
QPC5	Quality of nursing staff	0.79*	0.20	0.24
QPC6	Overall rating of physician-nurse collaboration	0.74*	0.27	0.28
~~QPC7~~	~~Access to patient information (e.g., availability of nurse assigned to patient, chart, test results)~~	~~0.53~~	~~0.27~~	~~0.35~~
EPF1	Ease of admitting patients	0.28	0.30	0.65*
EPF2	Ease of scheduling inpatient tests/therapy	0.30	0.26	0.79*
EPF3	Ease of scheduling outpatient tests/therapy	0.26	0.28	0.78*
EPF4	Ease of scheduling outpatient surgery	0.27	0.29	0.72*
EPF5	Turnaround for lab results	0.36	0.22	0.56*
~~EPF6~~	~~Turnaround for radiology results~~	~~0.35~~	~~0.20~~	~~0.53~~
CC1	Visibility/Accountability of Hospital Administration	0.26	0.76*	0.28
CC2	Communication between yourself and Hospital Administration	0.23	0.83*	0.24
CC3	Responsiveness of Hospital Administration to ideas and needs of the medical staff	0.27	0.84*	0.26
CC4	Degree to which physicians are involved in decision making at this facility	0.29	0.79*	0.25
CC5	Degree to which Hospital Administration seeks mutually beneficial solutions to physicians’ issues	0.27	0.85*	0.25
CC6	Degree to which you are interested as a valued member to this facility’s medical staff	0.28	0.81*	0.27
SA2	Degree to which this facility makes caring for your patients easier	0.58*	0.49	0.42
SA1	Overall quality of care at this facility	0.68*	0.42	0.34
~~FA1~~	~~Likelihood that you will maintain your level of admissions to, or procedures/surgeries at, this facility over the next year~~	~~0.45~~	~~0.52~~	~~0.31~~
FA2	Likelihood you would recommend this facility to other physicians	0.53	0.57*	0.30
FA3	Likelihood you would recommend this facility to friends and family for care	0.56*	0.51	0.32
~~SA3~~	~~Overall satisfaction with this facility~~	~~0.70*~~	~~0.41~~	~~0.60*~~

Appendix 4.23. Null Model: Rotated Factor Pattern, Three-factor Solution, Inpatient Survey Items

Note: Values greater than 0.55 are flagged by an ”*”; cross-loading items are presented in strikethrough texts.

Variable Label	Item	Factor 1	Factor 2	Factor 3
N1	Friendliness/courtesy of the nurses	0.80*	0.20	0.26
N2	Promptness in responding to the call button	0.69*	0.19	0.30
N3	Nurses' attitude toward your requests	0.842*	0.21	0.28
N4	Amount of attention paid to your special or personal needs	0.81*	0.22	0.31
N5	How well the nurses kept you informed	0.76*	0.26	0.35
N6	Skill of the nurses	0.77*	0.23	0.29
D1	Staff concern for your privacy	0.45	0.28	0.56*
~~D3~~	~~How well your pain was controlled~~	~~0.43~~	~~0.26~~	~~0.53~~
PI1	Degree to which hospital staff addressed your emotional needs	0.51	0.28	0.63*
PI2	Response to concerns/complaints made during your stay	0.53	0.29	0.61*
PI3	Staff effort to include you in decisions about your treatment	0.46	0.36	0.61*
~~PI4~~	~~Speed of discharge process after you were told you could go home~~	~~0.24~~	~~0.23~~	~~0.53~~
PI5	Instructions given about how to care for yourself at home	0.32	0.33	0.61*
P1	Time physician spent with you	0.21	0.78*	0.29
P2	Physician's concern for your questions and worries	0.23	0.87*	0.27
P3	How well physician kept you informed	0.22	0.85*	0.28
P4	Friendliness/courtesy of physician	0.24	0.83*	0.25
P5	Skill of physician	0.25	0.75*	0.26
D1	Extent to which you felt ready to be discharged	0.25	0.31	0.56*
OA1	How well staff worked together to care for you	0.62*	0.31	0.50
OA2	Likelihood of your recommending this hospital to others	0.58*	0.31	0.46
OA3	Overall rating of care given at hospital	0.62*	0.32	0.48

Appendix 4.24. Item-item Correlation of Employee Partnership Survey Items

	OW1	OW2	OW3	OW4	OW5	OO1	OO2	OO3	OO4	OO5	OO6	SL1	SL2	SL3	SL4	SL5	SL6	SL7	SL8	RE1	RE2	RE3	DM1	DM2	DM3	DM4	DM5	DM6	DM7	TW1	TW2	MW1	MW2	MW3	MW4	MW5	OW6	MW6	OO7
OW1	1.00	0.50	0.50	0.51	0.49	0.29	0.33	0.33	0.30	0.35	0.37	0.34	0.35	0.34	0.33	0.36	0.37	0.37	0.29	0.28	0.30	0.28	0.38	0.39	0.40	0.38	0.37	0.38	0.39	0.45	0.42	0.37	0.37	0.39	0.36	0.37	0.41	0.38	0.36
OW2	0.50	1.00	0.74	0.71	0.74	0.33	0.42	0.47	0.38	0.42	0.47	0.36	0.36	0.37	0.34	0.36	0.36	0.40	0.30	0.32	0.34	0.32	0.38	0.39	0.39	0.38	0.38	0.37	0.38	0.55	0.53	0.41	0.41	0.41	0.36	0.41	0.56	0.43	0.43
OW3	0.50	0.74	1.00	0.79	0.78	0.33	0.40	0.44	0.36	0.43	0.47	0.38	0.40	0.39	0.36	0.40	0.40	0.43	0.32	0.35	0.36	0.33	0.41	0.43	0.44	0.43	0.43	0.42	0.43	0.62	0.64	0.42	0.42	0.45	0.38	0.40	0.62	0.46	0.44
OW4	0.51	0.71	0.79	1.00	0.80	0.37	0.44	0.47	0.40	0.48	0.50	0.41	0.43	0.42	0.39	0.43	0.43	0.45	0.34	0.38	0.38	0.34	0.43	0.45	0.46	0.45	0.44	0.43	0.44	0.62	0.61	0.48	0.47	0.50	0.41	0.46	0.63	0.51	0.48
OW5	0.49	0.74	0.78	0.80	1.00	0.34	0.43	0.47	0.39	0.45	0.49	0.39	0.40	0.40	0.36	0.40	0.40	0.43	0.32	0.35	0.37	0.34	0.41	0.43	0.43	0.43	0.42	0.41	0.41	0.60	0.60	0.42	0.42	0.45	0.38	0.41	0.64	0.46	0.46
OO1	0.29	0.33	0.33	0.37	0.34	1.00	0.59	0.50	0.45	0.62	0.51	0.38	0.40	0.40	0.41	0.36	0.38	0.41	0.33	0.33	0.34	0.29	0.39	0.40	0.40	0.38	0.38	0.38	0.40	0.36	0.31	0.47	0.44	0.44	0.38	0.46	0.32	0.58	0.59
OO2	0.33	0.42	0.40	0.44	0.43	0.59	1.00	0.79	0.67	0.77	0.71	0.50	0.52	0.53	0.49	0.47	0.48	0.51	0.41	0.41	0.45	0.39	0.45	0.46	0.45	0.45	0.45	0.43	0.44	0.43	0.37	0.49	0.46	0.49	0.45	0.46	0.40	0.59	0.72
OO3	0.33	0.47	0.44	0.47	0.47	0.50	0.79	1.00	0.72	0.71	0.75	0.50	0.52	0.53	0.48	0.48	0.49	0.52	0.41	0.43	0.46	0.41	0.45	0.45	0.44	0.44	0.43	0.41	0.43	0.44	0.39	0.47	0.44	0.48	0.45	0.45	0.44	0.56	0.72
OO4	0.30	0.38	0.36	0.40	0.39	0.45	0.67	0.72	1.00	0.67	0.75	0.50	0.51	0.53	0.48	0.48	0.47	0.51	0.41	0.40	0.44	0.39	0.43	0.41	0.40	0.40	0.39	0.37	0.39	0.37	0.31	0.42	0.40	0.44	0.45	0.40	0.39	0.51	0.70
OO5	0.35	0.42	0.43	0.48	0.45	0.62	0.77	0.71	0.67	1.00	0.75	0.58	0.62	0.61	0.59	0.57	0.58	0.62	0.48	0.50	0.50	0.43	0.53	0.54	0.54	0.53	0.53	0.52	0.53	0.48	0.42	0.54	0.50	0.56	0.53	0.49	0.45	0.69	0.82
OO6	0.37	0.47	0.47	0.50	0.49	0.51	0.71	0.75	0.75	0.75	1.00	0.57	0.59	0.60	0.55	0.54	0.55	0.59	0.44	0.46	0.49	0.44	0.51	0.50	0.49	0.49	0.47	0.45	0.47	0.47	0.40	0.50	0.48	0.53	0.51	0.47	0.48	0.60	0.79
SL1	0.34	0.36	0.38	0.41	0.39	0.38	0.50	0.50	0.50	0.58	0.57	1.00	0.76	0.75	0.59	0.65	0.63	0.64	0.45	0.46	0.48	0.42	0.51	0.54	0.54	0.56	0.52	0.50	0.51	0.46	0.38	0.41	0.40	0.46	0.48	0.37	0.41	0.50	0.61
SL2	0.35	0.36	0.40	0.43	0.40	0.40	0.52	0.52	0.51	0.62	0.59	0.76	1.00	0.77	0.64	0.72	0.71	0.70	0.48	0.51	0.50	0.43	0.53	0.58	0.60	0.59	0.58	0.56	0.56	0.49	0.42	0.43	0.42	0.51	0.50	0.38	0.44	0.55	0.64
SL3	0.34	0.37	0.39	0.42	0.40	0.40	0.53	0.53	0.53	0.61	0.60	0.75	0.77	1.00	0.61	0.66	0.65	0.66	0.48	0.51	0.51	0.43	0.51	0.55	0.54	0.55	0.52	0.50	0.51	0.47	0.39	0.43	0.41	0.49	0.49	0.38	0.42	0.53	0.64
SL4	0.33	0.34	0.36	0.39	0.36	0.41	0.49	0.48	0.48	0.59	0.55	0.59	0.64	0.61	1.00	0.61	0.61	0.64	0.45	0.42	0.44	0.39	0.51	0.51	0.50	0.49	0.50	0.47	0.50	0.43	0.37	0.43	0.42	0.48	0.48	0.40	0.38	0.53	0.60
SL5	0.36	0.36	0.40	0.43	0.40	0.36	0.47	0.48	0.48	0.57	0.54	0.65	0.72	0.66	0.61	1.00	0.79	0.66	0.47	0.49	0.48	0.42	0.52	0.57	0.58	0.57	0.54	0.53	0.53	0.47	0.41	0.41	0.40	0.51	0.50	0.36	0.44	0.51	0.58
SL6	0.37	0.36	0.40	0.43	0.40	0.38	0.48	0.49	0.47	0.58	0.55	0.63	0.71	0.65	0.61	0.79	1.00	0.68	0.48	0.48	0.48	0.41	0.53	0.57	0.60	0.56	0.54	0.53	0.54	0.48	0.41	0.44	0.44	0.56	0.52	0.39	0.43	0.54	0.60
SL7	0.37	0.40	0.43	0.45	0.43	0.41	0.51	0.52	0.51	0.62	0.59	0.64	0.70	0.66	0.64	0.66	0.68	1.00	0.53	0.48	0.48	0.43	0.57	0.59	0.59	0.57	0.56	0.54	0.62	0.50	0.44	0.46	0.45	0.53	0.53	0.40	0.44	0.56	0.63
SL8	0.29	0.30	0.32	0.34	0.32	0.33	0.41	0.41	0.41	0.48	0.44	0.45	0.48	0.48	0.45	0.47	0.48	0.53	1.00	0.42	0.39	0.35	0.40	0.39	0.39	0.37	0.37	0.35	0.38	0.37	0.32	0.34	0.34	0.39	0.41	0.31	0.33	0.45	0.50
RE1	0.28	0.32	0.35	0.38	0.35	0.33	0.41	0.43	0.40	0.50	0.46	0.46	0.51	0.51	0.42	0.49	0.48	0.48	0.42	1.00	0.57	0.43	0.41	0.43	0.44	0.43	0.41	0.40	0.40	0.45	0.36	0.38	0.35	0.42	0.40	0.32	0.38	0.48	0.51
RE2	0.30	0.34	0.36	0.38	0.37	0.34	0.45	0.46	0.44	0.50	0.49	0.48	0.50	0.51	0.44	0.48	0.48	0.48	0.39	0.57	1.00	0.58	0.43	0.44	0.43	0.43	0.41	0.40	0.41	0.43	0.36	0.39	0.39	0.43	0.42	0.35	0.38	0.48	0.52
RE3	0.28	0.32	0.33	0.34	0.34	0.29	0.39	0.41	0.39	0.43	0.44	0.42	0.43	0.43	0.39	0.42	0.41	0.43	0.35	0.43	0.58	1.00	0.38	0.37	0.37	0.37	0.35	0.34	0.35	0.39	0.34	0.35	0.35	0.39	0.38	0.33	0.36	0.42	0.45
DM1	0.38	0.38	0.41	0.43	0.41	0.39	0.45	0.45	0.43	0.53	0.51	0.51	0.53	0.51	0.51	0.52	0.53	0.57	0.40	0.41	0.43	0.38	1.00	0.71	0.64	0.62	0.60	0.59	0.63	0.47	0.41	0.46	0.46	0.51	0.48	0.41	0.42	0.54	0.54
DM2	0.39	0.39	0.43	0.45	0.43	0.40	0.46	0.45	0.41	0.54	0.50	0.54	0.58	0.55	0.51	0.57	0.57	0.59	0.39	0.43	0.44	0.37	0.71	1.00	0.83	0.81	0.78	0.77	0.78	0.52	0.46	0.45	0.45	0.53	0.51	0.40	0.43	0.55	0.54
DM3	0.40	0.39	0.44	0.46	0.43	0.40	0.45	0.44	0.40	0.54	0.49	0.54	0.60	0.54	0.50	0.58	0.60	0.59	0.39	0.44	0.43	0.37	0.64	0.83	1.00	0.82	0.80	0.80	0.80	0.54	0.48	0.45	0.45	0.54	0.49	0.41	0.43	0.55	0.53
DM4	0.38	0.38	0.43	0.45	0.43	0.38	0.45	0.44	0.40	0.53	0.49	0.56	0.59	0.55	0.49	0.57	0.56	0.57	0.37	0.43	0.43	0.37	0.62	0.81	0.82	1.00	0.84	0.82	0.78	0.53	0.47	0.43	0.43	0.49	0.48	0.39	0.42	0.53	0.53
DM5	0.37	0.38	0.43	0.44	0.42	0.38	0.45	0.43	0.39	0.53	0.47	0.52	0.58	0.52	0.50	0.54	0.54	0.56	0.37	0.41	0.41	0.35	0.60	0.78	0.80	0.84	1.00	0.85	0.79	0.52	0.48	0.42	0.41	0.48	0.46	0.38	0.41	0.52	0.52
DM6	0.38	0.37	0.42	0.43	0.41	0.38	0.43	0.41	0.37	0.52	0.45	0.50	0.56	0.50	0.47	0.53	0.53	0.54	0.35	0.40	0.40	0.34	0.59	0.77	0.80	0.82	0.85	1.00	0.81	0.51	0.47	0.42	0.42	0.48	0.45	0.39	0.40	0.52	0.50
DM7	0.39	0.38	0.43	0.44	0.41	0.40	0.44	0.43	0.39	0.53	0.47	0.51	0.56	0.51	0.50	0.53	0.54	0.62	0.38	0.40	0.41	0.35	0.63	0.78	0.80	0.78	0.79	0.81	1.00	0.51	0.47	0.45	0.45	0.51	0.48	0.41	0.40	0.54	0.52
TW1	0.45	0.55	0.62	0.62	0.60	0.36	0.43	0.44	0.37	0.48	0.47	0.46	0.49	0.47	0.43	0.47	0.48	0.50	0.37	0.45	0.43	0.39	0.47	0.52	0.54	0.53	0.52	0.51	0.51	1.00	0.74	0.46	0.45	0.48	0.43	0.42	0.53	0.51	0.48
TW2	0.42	0.53	0.64	0.61	0.60	0.31	0.37	0.39	0.31	0.42	0.40	0.38	0.42	0.39	0.37	0.41	0.41	0.44	0.32	0.36	0.36	0.34	0.41	0.46	0.48	0.47	0.48	0.47	0.47	0.74	1.00	0.40	0.40	0.43	0.37	0.37	0.51	0.45	0.41
MW1	0.37	0.41	0.42	0.48	0.42	0.47	0.49	0.47	0.42	0.54	0.50	0.41	0.43	0.43	0.43	0.41	0.44	0.46	0.34	0.38	0.39	0.35	0.46	0.45	0.45	0.43	0.42	0.42	0.45	0.46	0.40	1.00	0.75	0.68	0.49	0.73	0.40	0.71	0.54
MW2	0.37	0.41	0.42	0.47	0.42	0.44	0.46	0.44	0.40	0.50	0.48	0.40	0.42	0.41	0.42	0.40	0.44	0.45	0.34	0.35	0.39	0.35	0.46	0.45	0.45	0.43	0.41	0.42	0.45	0.45	0.40	0.75	1.00	0.72	0.51	0.68	0.40	0.66	0.51
MW3	0.39	0.41	0.45	0.50	0.45	0.44	0.49	0.48	0.44	0.56	0.53	0.46	0.51	0.49	0.48	0.51	0.56	0.53	0.39	0.42	0.43	0.39	0.51	0.53	0.54	0.49	0.48	0.48	0.51	0.48	0.43	0.68	0.72	1.00	0.58	0.61	0.45	0.68	0.56
MW4	0.36	0.36	0.38	0.41	0.38	0.38	0.45	0.45	0.45	0.53	0.51	0.48	0.50	0.49	0.48	0.50	0.52	0.53	0.41	0.40	0.42	0.38	0.48	0.51	0.49	0.48	0.46	0.45	0.48	0.43	0.37	0.49	0.51	0.58	1.00	0.49	0.39	0.57	0.53
MW5	0.37	0.41	0.40	0.46	0.41	0.46	0.46	0.45	0.40	0.49	0.47	0.37	0.38	0.38	0.40	0.36	0.39	0.40	0.31	0.32	0.35	0.33	0.41	0.40	0.41	0.39	0.38	0.39	0.41	0.42	0.37	0.73	0.68	0.61	0.49	1.00	0.37	0.66	0.49
OW6	0.41	0.56	0.62	0.63	0.64	0.32	0.40	0.44	0.39	0.45	0.48	0.41	0.44	0.42	0.38	0.44	0.43	0.44	0.33	0.38	0.38	0.36	0.42	0.43	0.43	0.42	0.41	0.40	0.40	0.53	0.51	0.40	0.40	0.45	0.39	0.37	1.00	0.46	0.46
MW6	0.38	0.43	0.46	0.51	0.46	0.58	0.59	0.56	0.51	0.69	0.60	0.50	0.55	0.53	0.53	0.51	0.54	0.56	0.45	0.48	0.48	0.42	0.54	0.55	0.55	0.53	0.52	0.52	0.54	0.51	0.45	0.71	0.66	0.68	0.57	0.66	0.46	1.00	0.70
OO7	0.36	0.43	0.44	0.48	0.46	0.59	0.72	0.72	0.70	0.82	0.79	0.61	0.64	0.64	0.60	0.58	0.60	0.63	0.50	0.51	0.52	0.45	0.54	0.54	0.53	0.53	0.52	0.50	0.52	0.48	0.41	0.54	0.51	0.56	0.53	0.49	0.46	0.70	1.00

Appendix 4.25. Item-item Correlation of Physician Partnership Survey Items

	QPC1	QPC2	QPC3	QPC4	QPC5	QPC6	QPC7	EPF1	EPF2	EPF3	EPF4	EPF5	EPF6	CC1	CC2	CC3	CC4	CC5	CC6	SA2	SA1	FA1	FA2	FA3	SA3
QPC1	1.00	0.75	0.73	0.67	0.70	0.70	0.55	0.48	0.52	0.48	0.48	0.45	0.43	0.49	0.48	0.50	0.48	0.50	0.50	0.66	0.70	0.55	0.61	0.61	0.78
QPC2	0.75	1.00	0.80	0.70	0.72	0.72	0.56	0.45	0.50	0.48	0.47	0.45	0.43	0.48	0.46	0.51	0.51	0.51	0.50	0.65	0.68	0.51	0.57	0.59	0.78
QPC3	0.73	0.80	1.00	0.75	0.74	0.72	0.57	0.46	0.51	0.49	0.48	0.48	0.46	0.48	0.47	0.51	0.50	0.51	0.50	0.66	0.70	0.51	0.59	0.60	0.79
QPC4	0.67	0.70	0.75	1.00	0.72	0.71	0.60	0.47	0.54	0.52	0.49	0.50	0.48	0.46	0.46	0.51	0.50	0.50	0.48	0.66	0.67	0.50	0.56	0.58	0.79
QPC5	0.70	0.72	0.74	0.72	1.00	0.78	0.55	0.43	0.49	0.46	0.45	0.47	0.44	0.44	0.42	0.46	0.46	0.46	0.45	0.63	0.69	0.50	0.58	0.60	0.77
QPC6	0.70	0.72	0.72	0.71	0.78	1.00	0.59	0.49	0.52	0.49	0.49	0.46	0.45	0.49	0.48	0.51	0.50	0.51	0.51	0.66	0.67	0.52	0.58	0.59	0.79
QPC7	0.55	0.56	0.57	0.60	0.55	0.59	1.00	0.45	0.51	0.46	0.45	0.49	0.46	0.44	0.43	0.48	0.48	0.48	0.47	0.60	0.58	0.46	0.51	0.50	0.71
EPF1	0.48	0.45	0.46	0.47	0.43	0.49	0.45	1.00	0.71	0.66	0.64	0.49	0.45	0.49	0.47	0.50	0.48	0.50	0.50	0.60	0.53	0.49	0.51	0.50	0.71
EPF2	0.52	0.50	0.51	0.54	0.49	0.52	0.51	0.71	1.00	0.79	0.71	0.58	0.54	0.50	0.48	0.51	0.49	0.51	0.51	0.63	0.58	0.51	0.53	0.54	0.77
EPF3	0.48	0.48	0.49	0.52	0.46	0.49	0.46	0.66	0.79	1.00	0.76	0.54	0.52	0.50	0.49	0.52	0.50	0.51	0.51	0.61	0.55	0.48	0.52	0.53	0.75
EPF4	0.48	0.47	0.48	0.49	0.45	0.49	0.45	0.64	0.71	0.76	1.00	0.53	0.50	0.50	0.49	0.51	0.48	0.50	0.51	0.59	0.55	0.50	0.53	0.53	0.73
EPF5	0.45	0.45	0.48	0.50	0.47	0.46	0.49	0.49	0.58	0.54	0.53	1.00	0.69	0.41	0.40	0.44	0.42	0.43	0.43	0.54	0.52	0.43	0.47	0.48	0.69
EPF6	0.43	0.43	0.46	0.48	0.44	0.45	0.46	0.45	0.54	0.52	0.50	0.69	1.00	0.40	0.38	0.42	0.39	0.40	0.40	0.50	0.50	0.42	0.45	0.46	0.66
CC1	0.49	0.48	0.48	0.46	0.44	0.49	0.44	0.49	0.50	0.50	0.50	0.41	0.40	1.00	0.87	0.80	0.73	0.77	0.75	0.61	0.58	0.55	0.61	0.59	0.65
CC2	0.48	0.46	0.47	0.46	0.42	0.48	0.43	0.47	0.48	0.49	0.49	0.40	0.38	0.87	1.00	0.85	0.76	0.81	0.80	0.62	0.57	0.58	0.64	0.60	0.65
CC3	0.50	0.51	0.51	0.51	0.46	0.51	0.48	0.50	0.51	0.52	0.51	0.44	0.42	0.80	0.85	1.00	0.84	0.88	0.83	0.68	0.61	0.60	0.66	0.62	0.70
CC4	0.48	0.51	0.50	0.50	0.46	0.50	0.48	0.48	0.49	0.50	0.48	0.42	0.39	0.73	0.76	0.84	1.00	0.88	0.81	0.66	0.58	0.56	0.63	0.59	0.67
CC5	0.50	0.51	0.51	0.50	0.46	0.51	0.48	0.50	0.51	0.51	0.50	0.43	0.40	0.77	0.81	0.88	0.88	1.00	0.86	0.67	0.60	0.60	0.67	0.62	0.69
CC6	0.50	0.50	0.50	0.48	0.45	0.51	0.47	0.50	0.51	0.51	0.51	0.43	0.40	0.75	0.80	0.83	0.81	0.86	1.00	0.67	0.60	0.63	0.69	0.63	0.69
SA2	0.66	0.65	0.66	0.66	0.63	0.66	0.60	0.60	0.63	0.61	0.59	0.54	0.50	0.61	0.62	0.68	0.66	0.67	0.67	1.00	0.80	0.68	0.76	0.75	0.89
SA1	0.70	0.68	0.70	0.67	0.69	0.67	0.58	0.53	0.58	0.55	0.55	0.52	0.50	0.58	0.57	0.61	0.58	0.60	0.60	0.80	1.00	0.68	0.77	0.78	0.88
FA1	0.55	0.51	0.51	0.50	0.50	0.52	0.46	0.49	0.51	0.48	0.50	0.43	0.42	0.55	0.58	0.60	0.56	0.60	0.63	0.68	0.68	1.00	0.82	0.76	0.70
FA2	0.61	0.57	0.59	0.56	0.58	0.58	0.51	0.51	0.53	0.52	0.53	0.47	0.45	0.61	0.64	0.66	0.63	0.67	0.69	0.76	0.77	0.82	1.00	0.90	0.78
FA3	0.61	0.59	0.60	0.58	0.60	0.59	0.50	0.50	0.54	0.53	0.53	0.48	0.46	0.59	0.60	0.62	0.59	0.62	0.63	0.75	0.78	0.76	0.90	1.00	0.79
SA3	0.78	0.78	0.79	0.79	0.77	0.79	0.71	0.71	0.77	0.75	0.73	0.69	0.66	0.65	0.65	0.70	0.67	0.69	0.69	0.89	0.88	0.70	0.78	0.79	1.00

Appendix 4.26. Item-item Correlation of Inpatient Survey Items

	N1	N2	N3	N4	N5	N6	D1	D3	PI1	PI2	PI3	PI4	PI5	P1	P2	P3	P4	P5	D1	OA1	OA2	OA3
N1	1.00	0.66	0.80	0.75	0.73	0.76	0.57	0.53	0.62	0.62	0.58	0.39	0.49	0.39	0.42	0.41	0.44	0.42	0.43	0.69	0.63	0.67
N2	0.66	1.00	0.73	0.72	0.70	0.65	0.53	0.52	0.58	0.61	0.56	0.41	0.47	0.41	0.41	0.41	0.40	0.37	0.42	0.62	0.57	0.60
N3	0.80	0.73	1.00	0.84	0.78	0.77	0.59	0.56	0.66	0.68	0.63	0.41	0.52	0.42	0.45	0.44	0.45	0.43	0.45	0.70	0.64	0.67
N4	0.75	0.72	0.84	1.00	0.81	0.76	0.60	0.57	0.67	0.69	0.64	0.42	0.53	0.44	0.46	0.46	0.45	0.43	0.46	0.71	0.65	0.69
N5	0.73	0.70	0.78	0.81	1.00	0.77	0.61	0.57	0.68	0.69	0.68	0.44	0.57	0.48	0.50	0.51	0.47	0.45	0.47	0.71	0.65	0.68
N6	0.76	0.65	0.77	0.76	0.77	1.00	0.58	0.54	0.63	0.64	0.61	0.40	0.52	0.41	0.45	0.44	0.45	0.45	0.44	0.69	0.64	0.68
D1	0.57	0.53	0.59	0.60	0.61	0.58	1.00	0.59	0.70	0.68	0.67	0.46	0.56	0.48	0.50	0.49	0.49	0.47	0.49	0.64	0.58	0.61
D3	0.53	0.52	0.56	0.57	0.57	0.54	0.59	1.00	0.67	0.65	0.63	0.41	0.50	0.45	0.47	0.46	0.46	0.44	0.48	0.61	0.56	0.59
PI1	0.62	0.58	0.66	0.67	0.68	0.63	0.70	0.67	1.00	0.80	0.77	0.47	0.59	0.52	0.54	0.53	0.52	0.49	0.53	0.71	0.65	0.68
PI2	0.62	0.61	0.68	0.69	0.69	0.64	0.68	0.65	0.80	1.00	0.78	0.48	0.59	0.51	0.54	0.54	0.52	0.50	0.52	0.73	0.68	0.71
PI3	0.58	0.56	0.63	0.64	0.68	0.61	0.67	0.63	0.77	0.78	1.00	0.48	0.62	0.56	0.59	0.59	0.56	0.53	0.53	0.70	0.64	0.68
PI4	0.39	0.41	0.41	0.42	0.44	0.40	0.46	0.41	0.47	0.48	0.48	1.00	0.57	0.40	0.39	0.40	0.37	0.35	0.52	0.46	0.43	0.45
PI5	0.49	0.47	0.52	0.53	0.57	0.52	0.56	0.50	0.59	0.59	0.62	0.57	1.00	0.49	0.52	0.52	0.50	0.48	0.61	0.59	0.54	0.57
P1	0.39	0.41	0.42	0.44	0.48	0.41	0.48	0.45	0.52	0.51	0.56	0.40	0.49	1.00	0.83	0.82	0.74	0.67	0.46	0.50	0.48	0.49
P2	0.42	0.41	0.45	0.46	0.50	0.45	0.50	0.47	0.54	0.54	0.59	0.39	0.52	0.83	1.00	0.87	0.83	0.76	0.48	0.54	0.51	0.53
P3	0.41	0.41	0.44	0.46	0.51	0.44	0.49	0.46	0.53	0.54	0.59	0.40	0.52	0.82	0.87	1.00	0.81	0.74	0.47	0.54	0.51	0.53
P4	0.44	0.40	0.45	0.45	0.47	0.45	0.49	0.46	0.52	0.52	0.56	0.37	0.50	0.74	0.83	0.81	1.00	0.81	0.46	0.53	0.51	0.53
P5	0.42	0.37	0.43	0.43	0.45	0.45	0.47	0.44	0.49	0.50	0.53	0.35	0.48	0.67	0.76	0.74	0.81	1.00	0.44	0.53	0.52	0.53
D1	0.43	0.42	0.45	0.46	0.47	0.44	0.49	0.48	0.53	0.52	0.53	0.52	0.61	0.46	0.48	0.47	0.46	0.44	1.00	0.50	0.47	0.49
OA1	0.69	0.62	0.70	0.71	0.71	0.69	0.64	0.61	0.71	0.73	0.70	0.46	0.59	0.50	0.54	0.54	0.53	0.53	0.50	1.00	0.78	0.82
OA2	0.63	0.57	0.64	0.65	0.65	0.64	0.58	0.56	0.65	0.68	0.64	0.43	0.54	0.48	0.51	0.51	0.51	0.52	0.47	0.78	1.00	0.87
OA3	0.67	0.60	0.67	0.69	0.68	0.68	0.61	0.59	0.68	0.71	0.68	0.45	0.57	0.49	0.53	0.53	0.53	0.53	0.49	0.82	0.87	1.00

Appendix 4.27. Final Model: Scale to Scale Correlation, Correlations Among Latent Factors Estimated, N=86

	Nursing Perceptions of Mgmt. Support	Nursing Satisfaction	Patient Perceptions of Nursing Care	Patient Perceptions of Physician Care	Physician Perceptions of Adm. Support	Physician Perceptions of Nursing Quality
Nursing Perceptions of Mgmt. Support	1	0.80 (p<0.0001)	0.32 (p=0.003)	0.16 (p=0.14)	0.34 (p=0.001)	0.31 (p=0.004)
Nursing Satisfaction	0.80 (p<0.0001)	1	0.37 (p=0.0005)	0.27 (p=0.01)	0.36 (p=0.0007)	0.42 (p<0.0001)
Patient Perceptions of Nursing Care	0.32 (p=0.003)	0.37 (p=0.0005)	1	0.78 (p<0.0001)	0.36 (p=0.0008)	0.52 (p<0.0001)
Patient Perceptions of Physician Care	0.16 (p=0.14)	0.27 (p=0.01)	0.78 (p<0.0001)	1	0.23 (p=0.04)	0.42 (p<0.0001)
Physician Perceptions of Adm. support	0.34 (p=0.001)	0.36 (p=0.0007)	0.36 (p=0.0008)	0.23 (p=0.04)	1	0.60 (p<0.0001)
Physician Perceptions of Nursing Quality	0.31 (p=0.004)	0.42 (p<0.0001)	0.52 (p<0.0001)	0.42 (p<0.0001)	0.60 (p<0.0001)	1

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CURRICULUM VITAE

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Healthcare Performance Professional
Healthcare System Strategic Planning | Innovation & Change Leadership | Thought Leadership

Healthcare Performance Expert directs, delivers, and elevates performance standards and service quality within a patient-centric ethos. Interprets and analyzes multiple data sources to formulate solutions that align with corporate goals and vision.

- **Strategy Development:** Researches, analyses and develops innovative care/business models
- **Thought Leadership:** Creates and communicates a common framework, vision, and structure to drive positive care quality and financial growth
- **Change Agent:** drives the achievement of quality growth and positively impacts financial outcomes
- **Executive Influence:** Cultivates relationships with Clients/C-Suite executives
- **Convenes Organizations:** through the innovation, development, and presentation of robust health care strategies.
- **Consultative Visionary:** guides health systems and groups in transforming both care and business models

Professional Experience

MITRE CORPORATION, MCLEAN, VA **APR 2014 – PRESENT**
THE MITRE CORPORATION IS A $1.48B NOT-FOR-PROFIT ORGANIZATION WITH MORE THAN 7.600 EMPLOYEES, OPERATING RESEARCH AND DEVELOPMENT CENTERS SPONSORED BY THE FEDERAL GOVERNMENT, DELIVERING SUPPORT TO FEDERAL CLIENTS ON SCIENTIFIC RESEARCH AND ANALYSIS, DEVELOPMENT AND ACQUISITION, SYSTEM ENGINEERING AND INTEGRATION.

LEAD CLINICAL QUALITY ANALYST
Support multiple U.S. Health and Human Services departments within MITRE's Center for Transforming Health, leveraging deep knowledge of healthcare operations, service, and quality to define solutions that support federal clients in driving enhanced quality and performance. Support multiple national projects utilizing astute methodologies, structures, and processes to research, and analyze federal client needs and objectives to formulate winning solutions.

Selective Accomplishments
- Lead research on formulating strategic advice to federal health IT decision makers in achieving federal health interoperability

- Led analysis and research on potential roles and opportunities relative to implementing 21st Century Cures Act for Federal Health Architecture
    - ❖ Gained executive recognition and received a SPARK award.
- Assisted Business Case Analysis evaluating options for VHA Enterprise EHR Modernization among 154 hospitals.
- Foster improved connections, engagement, and knowledge dissemination across Center for Transforming Health.
    - ❖ Gained executive recognition and received a SPARK award.
- Leveraged MITRE's big-data analytics capabilities in developing and applying predictive analytic modeling to determine risk factors of child maltreatment fatalities in the U.S.
- Partnered with federal agencies in program planning and development of concept paper and project proposal.
- Steered implementation of Medicare and Medicaid payment models and advised federal clients in achieving goals.
- Delivered 12 key milestones to steer implementation of new Accountable Care Organization (ACO) models.
- Managed a high-profile, politically sensitive qualitative assessment in response to a U.S. Congress directive to Secretary of Defense.
- Drove research of mandated program evaluation of population-based psychological health program for U.S. Special Forces.
- Steered a CMS-CCSQ Division Policy and Measures Coordination Workgroup (PMCG) covering 5 divisions and 100+ staff.
- Supported development of work program to differentiate MITRE's and the delivery of unique value to sponsors.
- Delivered technical leadership on projects overseeing quality and impact of recommendations for 5.400 providers.
- Received Service Awards from Mitre Corporation in 2015 and 2017 for efforts in addressing some of the nation's most critical problems and identifying innovative solutions that make a difference.

GEISINGER HEALTH SYSTEM AFFILIATE **OCT 2005 – APR 2014**
HOLY SPIRIT HOSPITAL & HEALTH SYSTEM, QUALITY & ORGANIZATIONAL PERFORMANCE, Camp Hill, PA
A MAJOR $780M HEALTHCARE PROVIDER IN SOUTH CENTRAL PA WITH A WORKFORCE OF 2,800 AND RECIPIENT OF NUMEROUS QUALITY DISTINCTIONS AND AWARDS FOR QUALITY AND COST-EFFICIENCY CARE.

PERFORMANCE IMPROVEMENT COORDINATOR (FEB 2013 – APR 2014), PROCESS IMPROVEMENT COORDINATOR (JUL 2007 – FEB 2013), AND ANALYST (OCT 2005 – JUL 2007)
Promoted twice to management positions, led establishment of vision and implementation of an enhanced systematic approach to drive performance excellence in patient-centric care. Led multiple ground-breaking studies that opened executive leaderships eyes to impact metrics have in improving healthcare quality. Contributed to quality and cost-efficiency care.

Selective Accomplishments

- Facilitated with VP of Medical Affairs on implementation of a transitional care project achieving $1.8M in savings.
- Conducted comprehensive annual review of the system's quality plan and prioritization of quality initiatives.
- Overhauled quality department structure and redefined staff job functions to drive enhanced efficiency.
- Saved $718K+ annually and gained national recognition as an Institute of Healthcare Improvement mentor hospital.
- Created and managed execution of the hospital's first Employee Reward and Recognition Program.
- Oversaw a team of 15 in saving $198K+ annually and 100% cardiac emergency response information congruency.
- Improved antibiotic order process accuracy from 60% to 90% and reduction of 1 day readmissions by 90%.
- Contributed to organization being recognized with several awards and accolades for quality care.

PENNSYLVANIA HOUSE OF REPRESENTATIVES, HARRISBURG, PA MAY 2012 – AUG 2012

HEALTH INFORMATICS POLICY RESEARCH PRACTICUM, HUMAN SERVICES COMMITTEE

Conducted a grant funded project investigating prescription abuse and effects on overall drug abuse.

- Worked closely with state legislators, Governor's Office, and law enforcement to collate and analyze data.
- Analyzed existing policy and presented findings resulting in changes in policy and the passing of the bill.

Education

JOHNS HOPKINS UNIVERSITY, BLOOMBERG SCHOOL OF PUBLIC HEALTH, Baltimore, MD

Doctor of Public Health – Healthcare Management and Leadership, 2018

- **Dissertation**: Examining the Relationships Among Patient Satisfaction, Nurse Satisfaction, Physician Satisfaction, and Management Support.

CARNEGIE MELLON UNIVERSITY, THE HEINZ COLLEGE, Pittsburgh, PA
Master of Science – Health Care Policy & Management, May 2005

BRIGHAM YOUNG UNIVERSITY, HAWAII CAMPUS, Laie, HI
Bachelor of Science – Information Systems, May 2001

- Cum Laude; Dean's List 2001

Professional Certifications

Certified Lean Practitioner, 2012
Certificate in Public Health Informatics, Johns Hopkins Bloomberg School of Public Health, 2012
Fellow of American College of Healthcare Executives (FACHE), 2011
Certified Professional in Healthcare Quality (CPHQ), 2008

Professional Affiliations

Toast of Tysons Corner, Toast Masters International, 2015 – Present
Healthcare Information & Management Systems Society, 2006 – Present
American College of Healthcare Executives, 2005 – Present
National Association for Healthcare Quality, 2005 – Present

Honors & Awards

ROAR Award, Mitre Corporation, 2018
Service Award, Mitre Corporation, 2015 & 2017
Spark Award, Mitre Corporation, 2016 & 2018
Health Information Technology for Economic and Clinical Health (HITECH) Training Grant, Office of National Coordinator, 2011
Service Award, Geisinger, 2010
Voted and awarded scholarships to attend ACHE Leaders Conference in 2006 and Congress on Healthcare Leadership, 2007
The Grable Foundation Internship Award, 2004
Jewish Healthcare Foundation & CORO Center for Civic Leadership Fellowship Award, 2004
The National Dean's List, 2001
Two Times Best Employee of the Month, BYUH Information Technology Service, 2001
Various scholarships for undergraduate studies, 1999 – 2001

Keywords: Strategy/Policy research/Interoperability research/ ONC/ DoD / DHA POTFF SOCOM / Cerner / Population Health / VHA / Clinical experience / eCQM / Veteran Spouse/ ACA / CMS / ACOs / Payment Models / Healthcare innovation research / Healthcare services research & operations/ Healthcare program strategic planning, evaluation & monitoring / quality & process improvement / Geisinger / Analysis / System / Public Health Informatics / PDMP / Informatics research / Healthcare domain expert